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MILITARY FREEHAND DRAWING.

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HAVING read with much interest two articles by M. le Lieutenant Lefebvre in the *Journal des Sciences Militaires*, entitled "Le Paysage Militaire," I was struck with their evident utility. I have not come across any similar work in the English language, and, as I am convinced that the art of freehand drawing is of as much importance as that of topography, or map making, in reconnaissances, I determined to try and produce a work on the same lines as, and generally based on "Le Paysage Militaire."

Starting, therefore, with the confession that "Military Freehand Drawing" is not an original production, and that the credit is due to the gallant Lieutenant above mentioned, for most of the ideas and hints contained in the following pages, I hope I may proceed with a clear conscience with the work.

To appreciate the fact that Lieutenant Lefebvre speaks with authority on the subject, one has only to look at the illustrations to his articles. That he is an artist of no mean talent, and a specialist in the subject, is evident from the excellence of his drawings, and the clearness of his explanations.

I would recommend those who have a good knowledge of French to study his articles in the September and October numbers of 1901 in the *Journal des Sciences Militaires*, above mentioned, in preference to this work. It is with diffidence I take up the task, and only do so with the hope that this important branch of military sketching may be brought to the notice of those who take an interest in the art, and are not sufficiently acquainted with French to understand the somewhat technical language used by Lieutenant Lefebvre.

This work is more or less a translation of "Le Paysage Militaire," but in places I have amplified the original in order to provide a fuller explanation of certain points, for the beginner.

I have also added an idea of my own, viz., the application of the panorama to orders and instructions in the field. Whether this is practical or not, I leave to the judgment of the reader.

The illustrations used in this work are all copies from "Le Paysage Militaire," though I feel I have done scant justice to the originals, which are excellent.

PART I.

IT would be well to commence by explaining what is meant by the term "Military freehand drawing."

There are two kinds of military sketching: topography, and free-hand. The former is the art of drawing the features and details of the country in plan, as a map. The latter is the art of representing the country in elevation, as a picture.

Military freehand drawing, then, is the art of drawing a picture of the country for certain particular military purposes, such as, for example, to illustrate, in a reconnaissance of an enemy's position, important information contained in the report.

To enable the reader to understand at once what is the scope of this work, let him turn to the opening lines of "*Le Paysage Militaire*." The author calls his articles "a collection of practical advice, allowing officers who have a taste for landscape drawing, to be able to exercise their talent in this art to the profit of their military education, and after a reconnaissance, to return with useful reports on the country which they have carefully studied while passing through it."

Perhaps one might go further and say that the hints and advice in the following pages will be of assistance, not only to the real artist, who will find that he has to keep some of his artistic senses under control, but to those who do not consider themselves artists.

Almost anyone, unless his fingers are all thumbs, could, with practice, produce a picture of an area of country which would be useful from a military point of view. All that is required to start with is confidence in oneself, and to conquer that feeling of diffidence in making a beginning because the result falls so far short of the intention.

To read a map properly it is necessary to have in one's mind a picture of the country the map is intended to represent. To those who have had much practice in map reading, and in comparing maps with the country, this faculty of producing at the same time a mind picture may be easy. To the ordinary individual, the appreciation of the shape of the ground from looking at a map is difficult. It is here that the utility of the picture or panorama of the country shows itself, in supplementing the map of the same. In some cases even the picture is preferable to the map.

But apart from the map, the panorama has other uses. There are few who can adequately describe the features of an area of country in a report. But a view of the same tract, faithfully drawn, will express more with less trouble than a laborious and voluminous report. It is easier to emphasise the important military points in a landscape in drawing an intelligent picture than by describing them in writing.

De Brack, a French writer on the subject, says:—"It is also indispensable that an officer should know how to draw as well as how to write, because often, with a couple of strokes of his pencil, he can say more than in a couple of pages of writing, since a few strokes with a pencil can be made more quickly and more easily than a report can be composed, confirming and classifying the details of the report better than the recollection one keeps during a long reconnaissance."

As the practice of the art of topography trains the eye to appreciate the shape of the ground, so also does the practice of drawing panoramas. To note the varying accidences of the terrain and the

many features, natural and artificial, that are to be found on its surface, and to reproduce them as faithfully as possible in a picture, will in time give the eye that faculty of quickly grasping the important points of a landscape, and of turning them to the many uses to which they may lend themselves in war.

It is hardly necessary here to impress on the reader the importance of training this faculty to the utmost extent. To have a good eye for ground gives to the tactician the power of attaining his object with a facility ensuring success, by using its accidents and features to conceal his force, to cover his advance, or to seize important points on the field of battle. A better example of a possessor of an eye for ground cannot be found than that of von Bredow. Besides being a cavalry leader of reputation, he was a good topographer and had an eye for ground. He made use of this faculty in leading his famous charge at the battle of Vionville. A cursory view of the ground over which he led his cavalry discloses no particular features that would lend themselves to a concealment of his advance. But his quick eye seized on its folds, and he so brought his force on the French line as to effect almost a complete surprise.

To quote again from de Brack: "Freehand drawing offers an immense advantage in war: it makes one accustomed to observe and comprehend, to appreciate distances and the nature of the ground, to realise clearly that which is seen, and, above all, to judge the possibility of the speed and of the aptness of enterprises. The practice of freehand drawing gives to the memory what may be called an instinctive faculty: that of grasping, so to speak, in spite of oneself and without being distracted by other thoughts, the form and the colour of objects before us."

Two other writers on the subject are quoted in "*Le Paysage Militaire*," and what they have to say is quite as instructive as de Brack, who is an acknowledged authority in France.

Jourat, in his "*Traité de Photographie appliquée à l'Art Militaire*," writes as follows: "A map, however carefully it may have been drawn, always leaves us in the presence of a puzzling general view, and fails to express the relief of objects, houses, trees, etc. The contours, and even the hachures give an insufficient idea of the shape of the ground. For most people, views drawn from conveniently chosen points greatly help the reading of maps, in reproducing nature under aspects which are familiar to them."

Again, a Capitaine P.-A. C. . . ., in a work entitled "*Panoramie Militaire*," observes: "The study of panoramic drawing is the necessary complement to topography. I even go so far as to say that it is sometimes more important than the latter in studying the shape of the ground, where one has to make a reconnaissance in countries that one sees for the first time."

It is hardly necessary to say more in favour of military freehand drawing and its importance in war. Let the reader judge for himself as he peruses this work, whether the writers quoted above, and the author of "*Le Paysage Militaire*" are not correct in impressing on the officer the military value of the art they so strongly advocate.

Before proceeding further with the subject of freehand drawing with the ultimate object of producing the panorama, let us shortly consider photography in this connection. Taking the art of the camera, by and large, the conclusion we must come to is that it is generally unsuitable for our purpose, and for the following reasons: Although

cameras nowadays are very handy and portable, and the dry plate and film have immensely simplified photography, there are many difficulties in the way of its efficient use in war. The processes of the development of the plates or films, and the ultimate printing of the picture, are slow, and by the time the finished print is produced, the moment of its utility may be past. Again, there are difficulties attending the amount of exposure necessary to produce a good negative, depending on the strength of the light and the state of the atmosphere. A haze, though it will not interfere so much in drawing the distant details of a landscape, will mar their clearness in a photograph, and so the picture from the camera will lose its value. The exposure necessary for the foreground is rather too much for the middle distance, and far too much for the distant background, and *vice versa*. Finally, the eye of the camera, the lens, sees differently to the human eye, in this way. The lens exaggerates distances and diminishes heights. This will be apparent if one compares the photograph of a view with the landscape as seen by the human eye. In this important detail, therefore, the photograph gives a wrong impression. Where the necessary apparatus is at hand, time is of no consequence, and the view is not a very distant one, and, above all, the light is good and the atmosphere clear, a camera is useful.

The advantage that drawing has of enabling the artist to emphasise the essential and to neglect the unimportant details of a landscape, from a military point of view, is not possessed by the camera, which produces a picture giving every minute detail of the country, and from its profusion of objects prevents one from quickly grasping the points of military interest.

Before embarking on the execution of a panorama, it is necessary that the beginner should acquire some general knowledge of the methods of drawing, as well as the elementary rules of perspective. Since this work is not intended to be a treatise on freehand drawing, properly speaking, but only as a help to those who would wish to apply the art to military uses, it is presumed that the reader has some knowledge of drawing already acquired. At the same time, some of the hints on drawing and perspective, which will be touched on hereafter, may be of assistance to the beginner. To commence with, practice in copying from other drawings will be found useful in acquiring the particular style that is the best for a military sketch.

There are certain peculiarities about a military landscape sketch that make it difficult of attainment at first, even to the accomplished artist. For this reason a special training is required.

Lieutenant Lefebvre, in this connection, remarks: "While in the purely artistic landscape, the laws of aesthetics and harmony, the search after effect and the picturesque are primary, in the military sketch these good qualities become absolutely secondary, and only enter into it as an addition. . . ."

What is required in a military sketch is clearness and boldness in drawing, a firmness of touch, and a faithful reproduction of the outline of such parts of the landscape as are of military interest and value. It is here that the task is more difficult to the accomplished artist than to the beginner, because the former has, in a measure, to stifle his artistic spirit and look at the landscape, however beautiful it may be, with the matter-of-fact and passionless military eye. In this the beginner has the advantage, for the artistic spirit, if he has any, is dormant in him, and need not be awakened until he has attained an

almost mechanical method of reproducing the landscape with an eye to its military aspects.

Whether the sketch is one of a position or that of a broad tract of country, it is really what may be called a panorama, drawn at a more or less wide visual angle, depending on what the requirements are.

We will now consider the preliminary knowledge that must be acquired before attempting to sketch a panorama.

There are two essential physical powers in which the beginner must train himself: those of the hand and the eye.

As regards the hand, he should practice:—

1. The representation of the details of the ground at different distances by means of their outlines.
2. The representation of the shape of the ground by means of hachures, or contours in perspective.

As regards the eye, it should be trained:—

1. To appreciate lines and angles.
2. To observe and read the ground.

We will deal separately with these exercises, explaining how they are to be understood and practised.

Following this will come the execution of the panorama, and, finally, the application of the panorama to reconnaissances, etc.

THE TRAINING OF THE HAND.

It is essential for the sake of clearness in execution, that the panorama should be drawn in outline, and, as far as it admits of, in outline alone. The addition of shading is a mistake in a military sketch, and should be avoided as much as possible, as it tends to confuse the details of the picture, is a waste of time, and, when working with the pencil alone, is liable to become smudged, to the detriment of the sharpness of the drawing.

Since, therefore, shading is not generally to be made use of, one must trust to the intensity of the stroke alone to obtain the effect of perspective, and the variations of light and shade.

To cause the distances in a picture to recede in a natural manner by means of perspective is always the most difficult part of the beginner's lesson. In working with outlines only, the effect of perspective is arrived at by varying the intensity of the stroke in the following manner:—

In drawing the foreground of a picture, a heavy stroke is made use of by pressing firmly with the pencil.

The middle distance is drawn with a medium stroke, or the pencil used with a normal pressure.

The distances, or backgrounds, are put in with a fine stroke, using the pencil very lightly.

"Thus," as Lieutenant Lefebvre writes, "a scale of three planes is obtained, which will suffice, in the majority of cases, to give the drawing a receding effect, and a perspective easy to grasp, without using the process of shading. . . ."

He goes on to suggest that this scale should be graduated as follows:—

Objects up to a distance of 600 yards should be treated as the foreground.

From 600 yards to 1,200 yards as the middle distance.
Beyond 1,200 yards as the background.

"This graduation," he continues, "has the advantage of being sensibly approximate to the close, medium, and long ranges of infantry fire; it is a coincidence that will be very useful in a good number of cases."

This idea of graduating the picture by means of a scale of perspective is no doubt very well in theory, but it is doubtful if it would be possible in practice where the ordinary individual is concerned. The theory of a graduated perspective, whatever may be its value, is by the way, and need not affect the beginner in the drawing of his panorama.

If he remembers the general rule as to perspective, to keep the finest lines for the distant background, and gradually to thicken his strokes as he approaches the foreground, where he will finish with the heaviest strokes in the picture, it will be sufficient for his purpose. This rule, if carefully adhered to, will assist him considerably in getting the receding effect of perspective.

Instead of using the one pencil with a varying intensity of touch, it would be as well to have two or three pencils of different hardness, such as an H or HH for the background, an HB or H for the middle distance, and a B or HB for the foreground respectively.

The best of all pictures are finished with the pen and ink. Let the preliminary work be done with a lightly used pencil, and the sketch finished with the pen and ink. Pens of different thicknesses may be used for the various parts of the picture, as already described for the pencil. A panorama finished in pen and ink gains immensely over a pencil drawing in clearness of detail. It does not smudge and is more permanent, and is really easier to work with in bringing out the required effects.

Of course, where time is of consequence, and the work must be rapidly done, the pencil alone must be used, but when possible ink should always be the finishing medium. There is no difficulty in carrying ink on one's person in a small travelling ink-pot, and once the preliminary sketch is done with the pencil, it takes very little longer to finish it in ink.

The paper to be used in sketching should be of the smoothest surface procurable. Rough paper wears the point of the pencil very quickly, and it is essential that the pencil, especially in drawing the fine lines in the distant background, should be kept well sharpened. A small block containing sheets of emery paper is of great assistance in keeping a good point on a pencil with the least amount of trouble.

It is recommended by Lieutenant Lefebvre that the beginner should work on paper ruled with squares, such as what is known as section paper, or that used with the Cavalry Sketching Board; but care must be taken in choosing such paper that the squares are very faintly printed, and of a different colour to the pencil used. The squares are supposed to assist in guiding the strokes in their directions, and in keeping them to their proper proportions. At the same time, it must be remembered that a sketch on paper with squares on it is not so clear as one drawn on plain paper, and that the latter is preferable.

We will now pass to the study of the details on the surface of the ground, and how they are to be represented in the sketch.

BUILDINGS (HOUSES, FARMS, VILLAGES, ETC.).

Their outline should be plainly drawn, avoiding waste of time over details, even in the foreground. Generally speaking, it is best to commence by drawing the topmost parts, such as roofs, towers, high gable ends, etc., which, as a rule, first catch the eye. The outline of all buildings which may serve as landmarks, such as church towers, windmills, factory chimneys, etc., should be faithfully reproduced. The walls of enclosures, being nearly always of military importance, should have their direction and angles carefully drawn according to perspective.

Exaggeration in the height of buildings should be avoided, as it is apt to be misleading, tending to make them appear nearer than they really are.

In drawing details, some regard must be had to their distance. For example, in the foreground, doors and windows, besides being outlined, may be shaded in with a few cross strokes. In the middle distance, they would be left in outline alone. In the background, it would be sufficient only to show the roofs and mass of buildings in a general outline, without any details, taking care to make any especially noticeable buildings to stand out in the sketch so as to be easily recognised.

*Foreground.**Middle Distance**Background*

FIG. 1.

It is not necessary to finish the strokes and make them join at the angles. The drawing will thus gain in freedom and facility.

LINES OF COMMUNICATION.

Roads are drawn with two lines indicating the sides, and in drawing them care should be taken to observe the rules of perspective. When roads are found running diagonally, or straight across the front, they should be shown by two parallel lines more or less apart, according to the perspective. A glance at the illustration, Fig. 2, will explain how the width between the lines varies with the distance and direction in obeying the laws of perspective.

Paths will be drawn, as in topography, in narrower dotted lines.

Bridges, tunnels, etc., will be simply outlined, as shown in Fig. 2. Cuttings and embankments will be shaded by hachures in a conventional manner. Railways are distinguished from roads by drawing transverse lines representing sleepers. Telegraph lines by drawing the poles at intervals in perspective, decreasing the space between each and their height, as they recede in the distance.

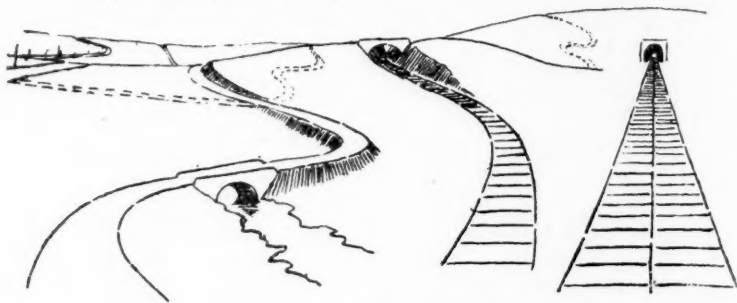


FIG. 2.

TREES.

Draw the general outline of the foliage and trunk, the thickness of the stroke depending on their distance. The outline of such trees that stand out from the rest as landmarks should be faithfully reproduced.



FIG. 3.

WOODS AND FORESTS.

Draw in dotted lines the outline of the border of the wood with its salients, etc., and, in the space thus enclosed, draw the trees more or less close to each other according to the thickness of the wood, the heaviness of the strokes and the size of the trees depending on their distance. Begin by filling in along the edges of the wood, and finish with the interior.

It is not necessary, indeed, it is impossible, to draw the trees as you see them, but the outline of characteristic clumps, or outstanding single trees and openings representing roads or clearings, should be carefully reproduced.

In a wood of large extent the receding effect of distance is obtained by decreasing the size of the trees and intensity of the touch towards the background.



FIG. 4.

Pines and firs, with their dark foliage, contrasting strongly with that of the deciduous trees, should be drawn with a bold touch. When these trees are found scattered about in a wood, amidst deciduous trees, their outline should be carefully drawn as they assist in getting one's bearings.



FIG. 5.

COPSES AND WASTE LANDS.

Outline, as for a wood, the extent of the copse in dotted lines, draw here and there some trees and fill in the rest with the representation of brushwood, more or less close, according to the density of the copse.

Waste land is indicated by drawing scattered brushwood and filling in with the conventional sign for sand in topography, *i.e.*, dots.

CULTIVATION, HEDGES, ORCHARDS.

Cultivation should only be drawn in a sketch when the information is of military value, to give the idea of the cover, or the practicability of the ground for movement.

When there is a great deal of cultivation of the same kind over a large area, it can be very well indicated in the sketch by a conventional letter.

Low crops, which do not interfere with view or movement, may be just indicated by drawing the boundaries of the fields, the hedges, etc.

If necessary, furrows can be shown by a series of parallel lines drawn in the direction in which the furrows run.

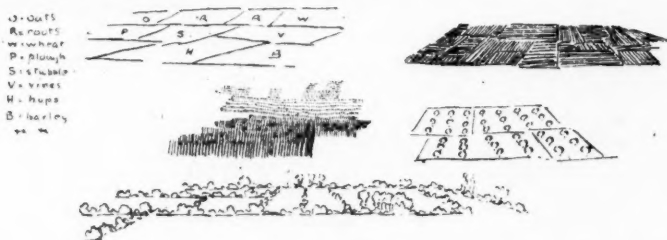


FIG. 6.

Hop fields and, abroad, vineyards, must always be shown, as they often form a very serious obstacle to free movement. These should be indicated by the letter *h* or *v* respectively if the area under such cultivation is very extensive. If only of a limited extent, a series of vertical dashes, representing hop or vine poles, should be drawn, care being taken to show in what direction the lines of poles run, for if the poles are planted in lines transverse to the direction of advance, they are a more serious obstacle to movement than if they run parallel to it. In the case where hop fields and vineyards are shown by a letter, as mentioned above, it would be as well to show the direction of the lines of poles by lines drawn on the sketch.

Orchards are shown by lines of trees drawn regularly, and hedges by lines of bushes more or less high.

SANDS, DUNES, MARSHES.

These will be drawn more or less in accordance with the topographical conventional signs for the same.



FIG. 7.

ROCKS, CLIFFS.

In drawing cliffs care should be taken to show their outlines and fissures, and the general line of their strata, as clearly as

possible. Each sort of rock has its characteristic feature; granite is cut up and angular (rounded and heavy if it has been exposed to the action of weather for long); chalk and sandstone generally have their lines of strata broken at right angles into the shape of blocks; schists are distorted; jurassic cliffs are particularly regular.

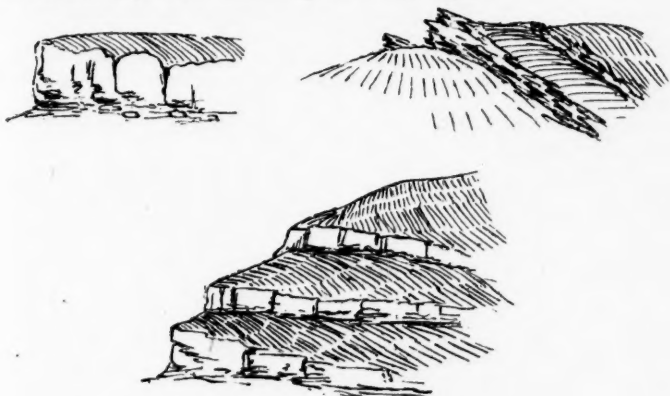


FIG. 8.

WATER (RIVERS, PONDS, LAKES, SEA, ETC.).

First draw the banks or shores with a firm, bold touch, then the reflections in the water of the objects on the banks, and, lastly, over

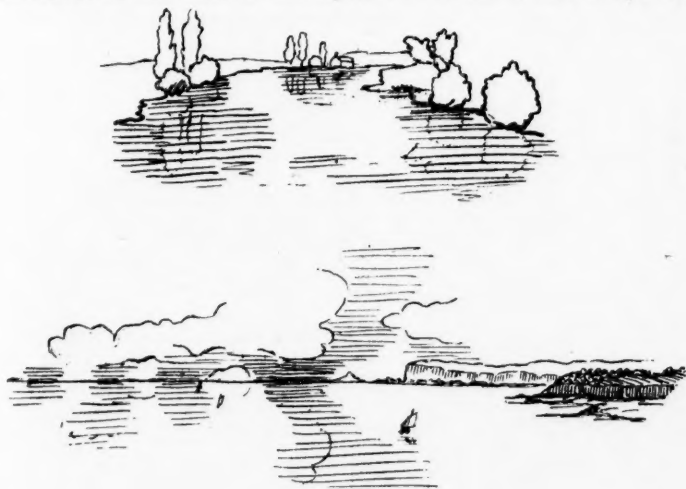


FIG. 9.

these draw a series of horizontal strokes becoming finer and closer to each other as they recede in the distance.

In drawing wide stretches of water, such as the sea or a large lake, it is often difficult to obtain an aqueous effect in the sketch. This may be done by drawing above the horizon a few curved touches to represent clouds, then between these a series of horizontal strokes that get finer, and with narrower intervals as they near the horizon and finish up by drawing the corresponding touches in the water below.

In the preceding description of the details that are found on the surface of the country, it is possible that some have been omitted; nevertheless, the general principles, as far as possible, have been stated. In the outline of the panorama, its form should be as clear and as simple as possible, and such as to leave no doubt as to the object it is meant to represent.

Every country has its own characteristics; for example, the broad fenceless plains of parts of the Continent differ very considerably from the much be-hedged and enclosed country of England.

REPRESENTATION OF THE SHAPE OF THE GROUND BY HACHURES AND CONTOURS IN PERSPECTIVE.

A very good method of showing the shape of the ground is by means of shading or stumping, but this method is wanting in a certain amount of clearness and distinctness. Besides, it is not possible to indicate changes of slope and other delicate details of relief, and in this the above method may be considered insufficient.

The following process, more exact, and quite as rapid, and which catches the eye at once, seems more preferable all round. It consists, once the outlines of the crests have been drawn, in representing the undulations of the ground by a series of contours or hachures so drawn as to give an idea of perspective. These will be amply sufficient to reproduce the undulations and folds of the ground.



FIG. 10.

It may be added that in the majority of cases the lines of the surface, such as furrows, hedges, and boundaries of fields, will contribute by their perspective, in showing the shape of the ground very clearly.

But there are regions that are open and bare, with an absence of fields and hedges, which render the drawing of their shape more difficult. There will only be the outline of the crests, re-entrants and spurs to guide the artist. It will be necessary for him, therefore, to trace in his mind the curves of the ground itself to get a clear idea of their appearance in perspective. To this end the best practice is to study a map in relief, or models showing hills and valleys, and to try and trace the run of contours in perspective. This exercise will be found very useful from the twofold point of view of freehand drawing and topography.

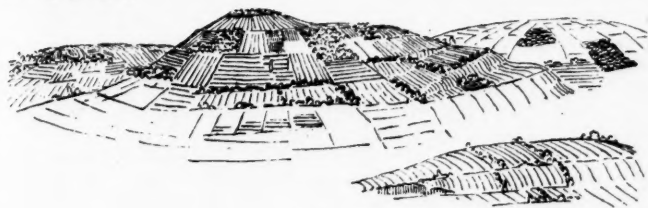


FIG. 11.

It is also necessary to know when to make use of contours or curves, and when to show the shape of the ground by means of hachures. If the position of the artist commands the ground he is drawing, curves will be the best method of doing so; but if the ground to be sketched commands the point of view, then hachures should be used. But no real rule can be laid down—experience and the appearance and nature of the ground will indicate the best method to be followed.

In a country composed of gently undulating plains, it is not rare to come across certain depressions in the ground, so much the more dangerous in that they are scarcely perceptible, and eminently suited to ambuscades. These are generally broad, shallow depressions, with gently sloping sides, whence hidden troops could unexpectedly spring up and open fire at point-blank range.

It is therefore essential, in every report or military sketch, to make a note of these peculiarities of the ground, where they have been discovered. To this end the following method is advised, and it is applicable up to a range of 600 or 700 yards, distances at which the outline of a man is still clearly visible:—

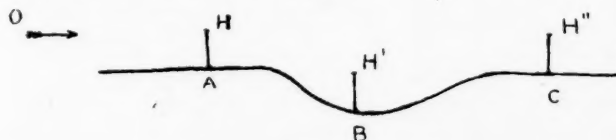


FIG. 12.

It is required to show a depression in the ground, ABC , to an observer placed in the direction O . The line of the crest A will be indicated, and three imaginary human silhouettes drawn, as at AH , BH' , CH'' . The part of the silhouette BH' that is seen will indicate the depth of the depression, while the comparison of the apparent heights of AH and CH'' will give the idea of its width.



FIG. 13.

THE TRAINING OF THE EYE.

The education of the eye, still more essential than that of the hand, relies entirely on the practice of the observer. He must learn to look, compare, judge, and realise, which demands a long and continuous practice. But, in return, the faculty of observation possesses this valuable property, that, once developed, it very quickly comes back to one, and then works by instinct, without distracting the mind from the ordinary course of its thoughts.

This faculty should be exercised on all occasions, when on the march, during halts—briefly, under any circumstances when its use need no longer fix one's attention.

APPRECIATION OF LINES AND ANGLES.

It is very necessary to be able to estimate lines and angles accurately—it is the elementary basis of all drawing.

As a guide in measuring lateral distances and heights, a pencil held at a convenient distance from the eye is very useful, but care must be taken that the distance at which the pencil is so held is always the same, otherwise the measurements will not have the same proportion. For beginners, a useful method is to tie a piece of string to the pencil, and, having obtained the correct distance from the eye to suit the drawing, hold the other end of the string between the teeth, keeping it always tight when taking measurements. By this means the pencil will always be held at the same distance from the eye. Instead of a pencil, a graduated ruler may be used.

In estimating angles, a carpenter's rule, which is hinged, will be found useful. Also the thumb, held at arm's length, is a very valuable means of comparison, if one has first found out the visual angle it subtends. On an average this is about $2\frac{1}{2}^{\circ}$.

For beginners in the art of sketching, these methods are of great value as a means of control in estimating lateral distances, heights, and angles. But after a certain amount of training and continual practice in drawing, the eye will of itself accomplish these estimates without the aid of such rudimentary methods, and will acquire for itself a sense of proportion which has no longer any need for such aids.

OBSERVATIONS OF THE COUNTRY; PROBLEMS OF THE GROUND.

To know how to estimate lines and angles accurately, is valuable, still it is only the geometric, or, so to say, the mechanical part of observation; more can, and ought to be, exacted from this faculty.

It should be used with great judgment, and should be accustomed to realise accurately that which is seen, and to determine what is desirable to make a note of. It is precisely in this sense that the military sketch possesses a style of its own.

The eye of the artist pure and simple takes no note of certain details which the eye of the officer should, on the contrary, grasp and note with the most scrupulous accuracy. In a soft distant view which, to the painter, would only seem a bluish mass, to be rendered broadly and without much care for detail, the military sketcher notes different ridges, changes of slope, edges of woods, hedges; everything, in a word, which has a tactical value.

It is necessary, moreover, to beware of certain deceptive illusions. The excellent habit of looking carefully over the ground and considering practically the appearances of perspective, is to be encouraged.

Here, by way of example, are a few cases that may be called "problems of the ground," in which attentive observation has its importance.

1ST EXAMPLE (OUTSKIRTS OF A VILLAGE).

We will suppose that an officer, reconnoitring, arrives before the village of X—, which is about 1,500 yards distant. At first sight the village seems to extend across his front in a more or less straight line. On a closer examination, however, he finds that certain groups of houses appear higher than the others, but they all have the same number of storeys, and the general structure of the houses appears to be similar. Therefore, these particular groups must appear higher because they are nearer, and for this reason constitute salients (useful information where an attack or defence is concerned). Further observation confirms this assumption, for into the salient supposed at *A* runs the road on which he stands. Again, from the salient presumed at *B* runs a double line of trees, which should lead him to suppose that another road enters the village at that point. Now, it is a rule in the building of villages that the salients are generally to be found at the *débouché* of roads by a natural law of extension.

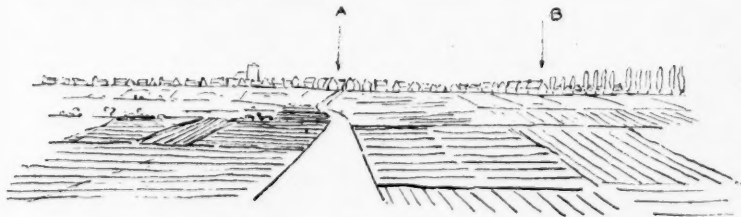


FIG. 14.

2ND EXAMPLE (EDGE OF WOOD).

Again, let us suppose him standing in front of a wood at such a distance that at first sight its border appears to have a sharp and continuous line. He brings his powers of observation into play, and at *A* and *B* he finds a very sensible difference in the height of the trees. Further, the lower row of trees have a more indistinct appearance than those at *B*. The former, therefore, must be farther away, and at *B* is a well marked angle.

Between *CD* the height of the trees appears lower. Can this be a re-entrant? On a closer observation it obviously cannot be, for the reason that their foliage is just as distinct as at *B* or *E*, besides, between *C* and

D the trunks of the trees are not to be seen, nor are the depths of the wood, as at the other points. Further, the road *R*, where it vanishes at *R'*, is sharp and clear, and does not seem to enter the wood at that point, while a well-defined gap at *D* seems to indicate the spot where the road must penetrate. Under these circumstances, he must conclude that there is no re-entrant between *CD*, but that the ground in front must be slightly undulating, and that a hardly perceptible rise interposes between him and the wood, and so hides the trunks of the trees and appears to make them seem lower.

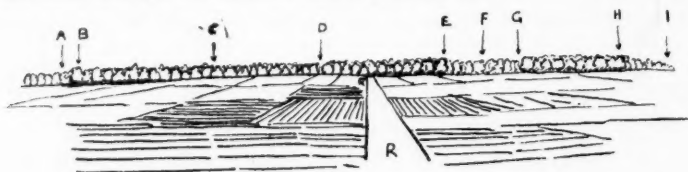


FIG. 15.

Continuing his investigations, he finds that at *F* the height of the trees is again lower, but he can see their trunks, while their foliage is more indistinct. He concludes, therefore, that there is probably a re-entrant there.

Finally, at *H* and *I* the gradual lowering of the trees, and the fact that their outline becomes more indistinct towards the right, leaves no doubt that there is a well-defined salient at *H*.

By these observations alone, and until he can get better information, the following sketch map will give the idea he has formed of the ground.

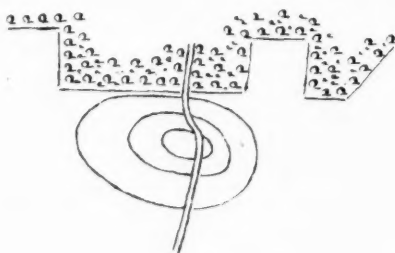


FIG. 16.

3RD EXAMPLE (A PLAIN OF A UNIFORM APPEARANCE).

Lastly, we will imagine our friend with a plain stretching in front of him, which does not appear to present any accidents of the ground, but is of a uniform and, more or less, level appearance.

At about 700 yards distance stretches a line across his front, which invariably cuts all the fields.

The question arises, Is it a continuous boundary between fields on either side, a cart track, or rather, the crest of a slight depression in the ground?

At one end of the line, as at the other, the sharpness is uniform. The line cuts the furrows on either side at different angles, which is

rare in the case of a boundary or track. He concludes that it must be the crest of a depression, but still a doubt exists. He examines the line further and finds that on the right it cuts a road of which the perspective is broken; that is to say, the lines representing its sides are not continuous. To the left the line cuts through an orchard, in which the trunks of the nearest trees are distinctly seen, while the trunks of those furthest off are not visible. This is due to the further trees being in a depression. There is, therefore, no more doubt—the line stretching across the front is the crest of a depression.



FIG. 17.

This problem of scarcely visible depressions is sometimes much more difficult to solve, and in certain regions is of an every-day occurrence.

In any case, from these few examples, it is easy to be convinced of the military value that is obtained from a close study of the ground, so changing in its aspects, so varied according to the country.

Nature, ever inspiring and fruitful in her teaching, is the great instructress above all. To the artist she reveals the beauty, the harmony, the grandeur of her lines. To the soldier she gives quickness of eye, precision of judgment, and aptness of decision.

In this connection let us again quote from de Brack: "To train oneself and advance in the attainment of quickness of eye, it is necessary that our imagination should be constantly at work—in war, in sport, during our travels, in our walks abroad, and while riding."

PART II.

THE APPLICATION OF THE PANORAMA IN THE FIELD AND IN RECONNAISSANCES.

The Theory and Practice of Panoramic Sketching.—We will now proceed to the theory and practice of sketching a panorama, supposing (which will not always be the case in war) that it is drawn without the risk of hostile interruption and without being limited as to time. It is better that the beginner should commence by drawing the panorama under these conditions, in order that he may realise the difficulties to be overcome, and consider and grasp each phase of the work more clearly.

THE CONSIDERATION OF THE WORK.

Examination of the Ground.—It is invariably necessary to commence by carefully examining the country to be sketched. In many cases it will be useful to draw, at a guess, a very rapid topographic sketch of the ground, as far as it can be seen. This, in spite of the inevitable inaccuracies it will contain, will at least have the advantage of fixing the ideas and of guiding the consideration of the ground in view;

further, this kind of rough sketch-map will often be the only information that an officer will be able to return with, after a reconnaissance, and for this reason should be frequently drawn for practice (Fig. 18).

Let us imagine an officer reconnoitring, and proceeding in a northerly direction along the road *A A'* (Figs 18 and 21). He arrives at the point *A*, which is on the summit of a ridge of medium elevation, and finds the view of an extensive landscape stretching out before him.

He sees:—

In the foreground, the slopes of the ridge on which he stands falling away to the north into a fairly deep ravine, while to the north-west they are gentle, and fade away into a moderately open valley.

In the middle distance, a second ridge, the north-east extremity of which partly hides the village of *B*—, but leaves its church spire clearly visible. Half-way down the southern slope of this ridge stands the mansion *C*, surrounded by a park, also some farms. Further west, the village *E*, the park *F*, and a river *H*, of medium importance, which flows under a stone bridge of three arches.

In the background, a third ridge, surmounted by a copse *K*, of which the edge is clearly visible. More to the west, a plateau, forming

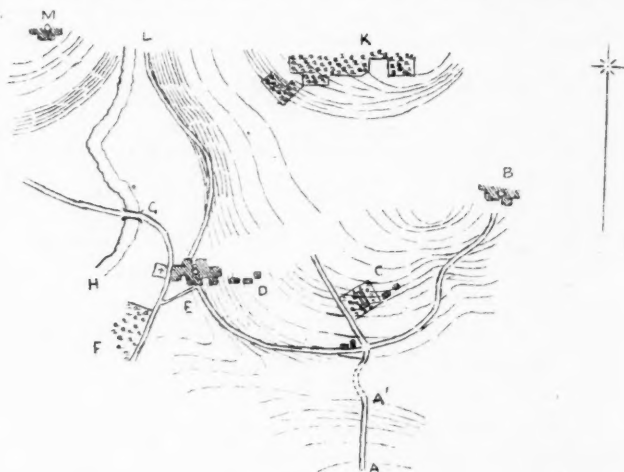


FIG. 18.

a terrace, on which are some farms. Downwards, a broad stretch of meadow land, which ends in a defile at *L*. Finally, on the opposite side, a plateau, with very steep slopes, at the summit of which is the village of *M*. In the far distance, a succession of several long ridges, and a line of tall poplars, which seem to indicate the further course of the river *H*.

The Discussion of its Tactical Value.—From this cursory review of the country, the officer has mentally analysed and sketched the panorama. It is now necessary to appreciate it from a military point of view.

It may here be remarked that it would be necessary to consider a concrete case, and start with a tactical scheme. However, it has not

been done here in order not to complicate a first attempt. For this reason, it is sufficient to imagine that the officer belongs to a force moving northwards, and that an enemy is expected to be met with in front—a general idea that answers the purpose.

To proceed, the first thing that is suggested from an examination of the ground is that the points *B*, *C*, *D*, and *E* would offer to the enemy a defensive line marked out clearly enough, its right resting on the river *H*, its left on the village *B*, and for a second line the ridge *K*. It is on these points that the interest of the drawing should be concentrated.

Fixing the Limits of the Panorama.—The subject is fixed; the horizontal limits must now be determined. Between the church spire of *B* in the east, to that of *M* in the west, the panorama contains all that it is necessary to represent.

The Choice of a Point of View.—It is important to consider the best point from which a panorama is to be sketched. In this case, the point *A*, where the officer is supposed to be standing, appears to be well chosen. It is fairly close to the centre of the subject, which it takes in at a convenient angle. On the other hand, if he takes up a more advanced position, he runs the risk of losing sight of the ridge *K*, and the edge of the copse which clothes its summit, and besides, the extent of the visual angle is considerably increased, which is always inconvenient. If, on the contrary, he retires, the slopes of the ridge *C* and all the slope in front of the village *E* may become invisible.

He determines, therefore, to remain at the point *A*, where the only inconvenience is that he is unable to see to the bottom of the ravine which separates him from the ridge *C*. But, once the work is finished, he can take a few steps forward and he will then be able to see into this dead ground, and make a report as to its particular features by means of a note on the sketch.

Note.—Concerning the position of the point of view, works on drawing advise the artist to place himself at a distance from the subject equal to two or three times its greatest dimension. It may be concluded, however, that this rule is chiefly to be applied to artistic landscapes. But, in the matter of a sketch for military purposes, where there is besides the resource of drawing successive panoramas side by side if the landscape embraced is too wide for one, it would not be necessary to adhere to this rule too literally. What is essential is to see clearly all that one wishes to represent.

Circumstances and the peculiar requirements of the case will determine where the line of the horizon should be fixed. Some panoramas gain by being drawn as a bird's-eye view; others, on the contrary, are more usefully sketched when observed from a point which has no relative command over them.

It may also be remarked that, in the majority of cases, the chief interest of the subject nearly always lies in the middle distance. The foreground may be considered as a base on which to accurately establish the sketch, the background, as an element, chiefly furnishing *data* for bearings.

THE METHOD OF SKETCHING THE PANORAMA.

The panorama having been sufficiently considered, we can now pass on to its execution, properly speaking.

The Preliminary Outline (Fig. 19).—The first operation consists of a general laying out and marking off of the chief points of the whole picture.

At each extremity of the sheet of sketching paper will be jotted down the position of the church spires at *B* and *L*, which are the lateral limits of the drawing. Next, the outline of the three poplars, *P*¹, *P*², *P*³, will be put in their relative places as accurately as possible. The two first have the advantage of cutting the horizon; as to the third, it is vertically below the extremity of the point *G* and of the west angle of the cemetery (Fig. 21).

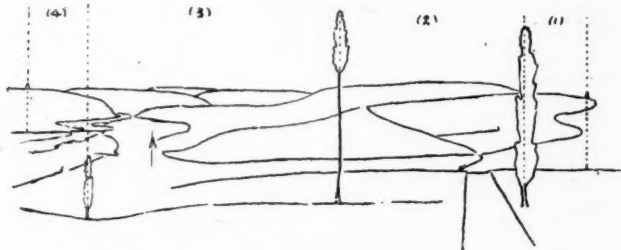


FIG. 19.

The work is thus divided into four spaces, in which the preliminary outline will be drawn, space by space.

In the space (1) the road winding towards the village *B* and the outline of the ridge *C* at that extremity will be indicated.

In the space (2) will be drawn the sides of the road *A A'*, the cross-roads at *C'*, and the outline of the four roads that meet there; then the wall of the park *C*, which faces *A*; and lastly the outline of the three ridges *A'*, *C*, and *K*.

In the third space, which is a little larger, care will be taken to place the church and spire of the village *E* as exactly as possible, as well as the different roads that meet there; also the outlines of the successive ridges that are seen, the south wall of the cemetery, and the bend of the river at *L*.

Finally, in the fourth space, the wall of the park, *F*, the banks of the river, and the bridge, *G*, with the road leading to it, will be indicated. To finish all, the crest of the plateau, *M*, will be drawn.

It is hardly necessary to mention that this preliminary work should be executed in pencil as lightly as possible, so as not to interfere with the drawing of the detail, which must now be taken in hand (Fig. 19).

Drawing the Detail.—Again taking successively each space (1, 2, 3, 4), the different details on the surface of the ground should now be drawn, commencing by preference with the foreground and working gradually back to the distant parts. This method assures the placing of the details in their proper position, because objects in the foreground, always larger and simpler in their lines, become very useful marks to establish other objects further off.

Taking, for example, the second space, the different vertical coincidences, *a*, *a'*, *a''*; *b*, *b'*, *b''*; *c*, *c'*, *c''* (Fig. 20), will be of assistance.

It may be as well to repeat here what has already been written, in order to impress it on the mind of the beginner, that it is necessary to proportion the intensity of the stroke of the pencil or pen to the distance at which the objects are placed.

A heavy stroke for the foreground,

A normal stroke for the middle distance; and

A very light stroke for the background.

Taking Fig. 20 as an example, each space will be filled in by the same method.

Note.—The great difficulty in drawing in the detail is to avoid being lost in a crowd of trifles, and in strictly confining the attention to that which it is essential to faithfully reproduce. For this reason, it is indispensable that the mind and the pencil should work together.

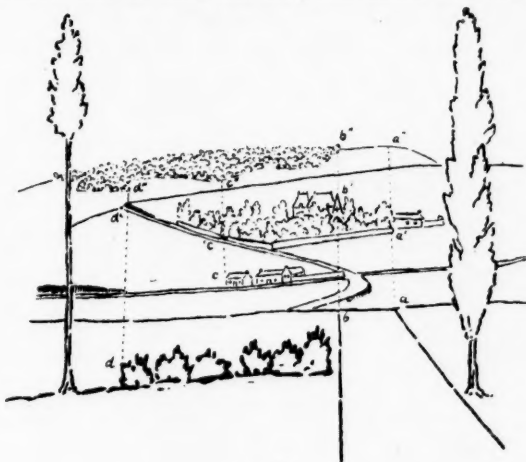


FIG. 20.

For example, in drawing the village *E*, it is not necessary to draw in exactly all the houses. The points to note are: its church spire, the clearly outlined shape of which is easily recognisable; the group of houses at its eastern end, which give the idea that the village might extend further behind the ridge; the cemetery which flanks it to the west, and which will be indicated by a cross, easily seen; and the walls of the southern border, of which the military importance is not to be disputed (Fig. 21).

Representation of the Shape of the Ground.—The outline of the ridges having already been laid out it only remains to finish the drawing. This will be done by showing the shape of the ground by means of elementary contours and hachures in perspective, as already illustrated further back. In this process, as in drawing the detail, the intensity of the stroke will depend on the distance of the ground.

But, contrary to the steps indicated above, it is better to commence drawing the shape of the ground in each space, at its furthest part, neglecting the most distant, of which the shape can scarcely be appreciated, and which are sufficiently indicated by their outline alone.

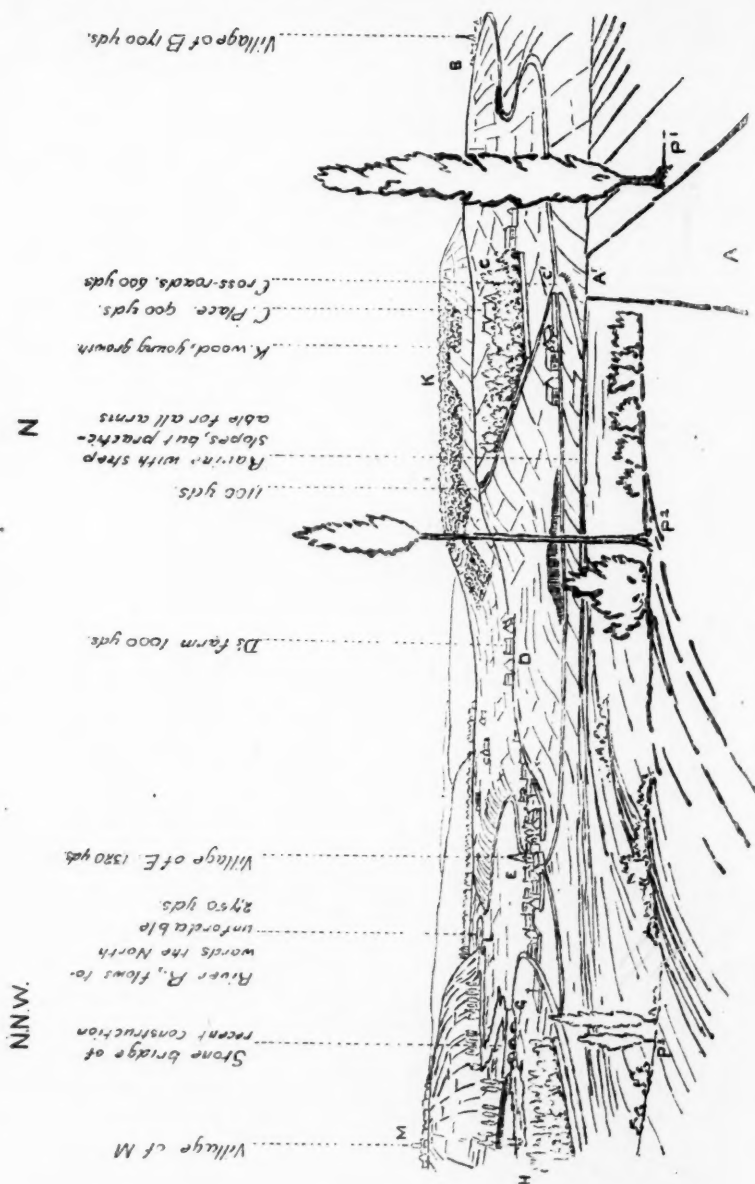


FIG. 21.

References, Remarks, Inking in.—In so far as the drawing is concerned, the panorama is finished. But it gains enormously in being completed by some written information, placed in the upper margin. It will give the names of localities, ranges, information on the practicability of the ground—in a word, all sorts of details which would strike the mind of the soldier and which will transform the panorama, pure and simple, into a very useful reconnaissance report (Fig. 21).

Finally, it is advisable at all times, when there is the opportunity, to ink in the sketch and the notes. The time that this operation requires is insignificant, and a durable document is produced in which the clear and firm drawing will inspire more confidence and certainty.

It is always essential that the position from which a panorama is drawn should be stated as exactly as possible, with reference to a map, if one exists. It is also important to indicate the points of the compass towards which one is looking, above the panorama, and clear of any other printing, so as to be easily distinguished.

Note.—The inevitable hesitation and slowness in preliminary exercises of this kind, executed on the ground, should not discourage the beginner; these defects will vanish with practice. It may be remarked, however, that the careful study of the ground to be sketched is generally the key to the solution of these difficulties, and that drawing will become relatively easy when the mind has been trained to thoroughly understand it.

THE APPLICATION OF THE PANORAMA IN THE FIELD.

Having learnt how to draw a panorama, let us now consider the various uses to which it can be put in the field.

Never draw a panorama for the sake of making a pretty picture. A panorama, intelligently drawn, should be made solely to illustrate information or simplify a report.

Panoramas in Connection with a Road Report.—These are of great utility in providing information about stretches of country offering details of interest. They are necessary in mountainous and broken country, intersected and wooded, where open stretches are rare and intermittent; or in a little known region traversed for the first time, the maps of which are incomplete or rough.

These panoramas would form a succession of rough sketches which might be compared to a series of windows opening on to the horizon, and which have besides, the advantage of extending the examination of the country beyond the topographic limits, that is to say, beyond the limits of the route followed and sketched.

Example.—The route *A-B* (Fig. 22) is being sketched and reported on. The wooded and enclosed nature of the country is such that only rare openings give a view of any extensive areas of landscape. The work of mapping is inevitably limited, and it is therefore supplemented with panoramas when the opportunities offer. At *C*, the road issues from the forest, and on the right a fairly extensive view opens out, showing certain marked details of the country. There is to be seen a river of medium size, a bridge, several mountainous ridges, a village with a well-marked church tower, a large country residence, and, on the summit of a ridge, the sharp outlines of a fort, with gun emplacements. The opportunity is a good one of making a note of what is to be seen by means of a rapid sketch.

But in a case of this kind it must be remembered that the sketch of the route is primary. The road to be reconnoitred may be long, and time may be of importance. Under these circumstances, the panorama will not be a complete sketch of the landscape, but a rough outline showing the bearing of the distant objects in their respective positions, and their general aspect, which will allow of their recognition.

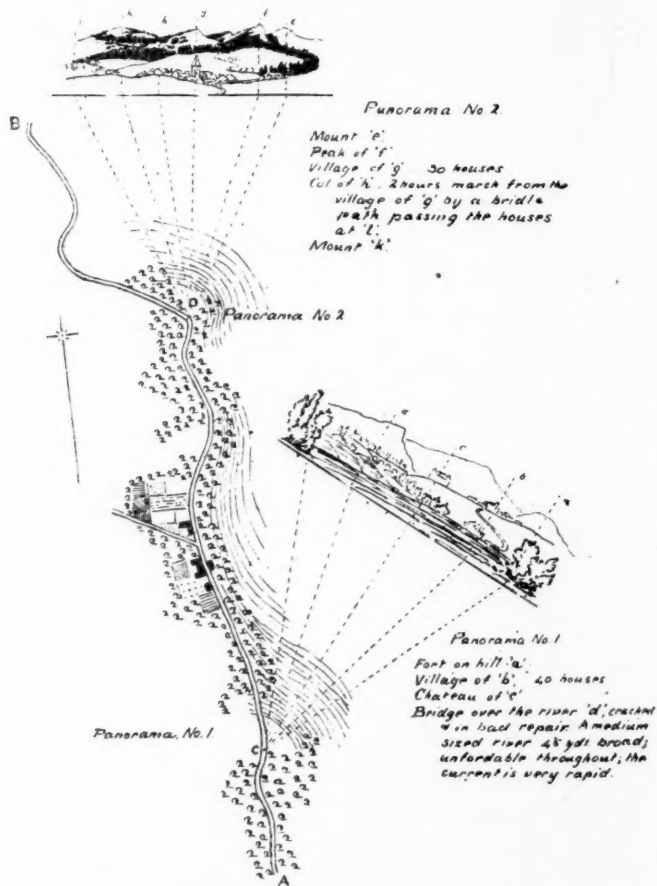


FIG. 22.

This sketch will be drawn on the same paper as that of the road, its visual angle being laid down as accurately as possible with reference to the route A-B.

Should it happen that an inhabitant of the country passes while the sketch is being made, he can be questioned with reference to the country in the distance, and the information will be jotted down in the margin alongside the sketch.

The reconnaissance is continued, and again the view opens out when the point *D* is reached. This time a fresh landscape is seen, and another panorama is sketched as before.

Panoramas Illustrating a Reconnaissance Report.—During the course of the reconnaissance of an area of country, there is every advantage in making a panoramic sketch of certain positions that may be met with, that are of particular interest, and of which the study is necessary by reason of their tactical situation.



FIG. 23.

Example.—A column has arrived at *A*, and on the morrow is to proceed to *B*, from which place information has been sent back of the approach of the enemy, whose objective appears to be *A*. It is very probable, therefore, that an engagement will occur next day. An officer from the column at *A* is ordered to reconnoitre the route *A-B*, which his column must follow. He possesses a map of doubtful utility, and which he must be particular to correct as he goes along.

Before starting out, he studies the map and prepares the paper for the sketch of the route, on which he will record all his observations. He accomplishes his journey from *A* to *B*, making careful notes of the surrounding country, and correcting the original map he had to start with. Arrived at *B*, he collects what information he can about the enemy, and turns back.

During his reconnaissance from *A* to *B*, two important details struck him:—

1. The passage of the river *R*, which his force should be able to hold with advantage against the enemy.
2. A flank position at the issue from *B*, where the enemy would, on the contrary, be able to oppose the force from *A* under conditions as to ground in every way favourable to himself.

These are the two characteristic and essential points of the reconnaissance, and he is fully justified in bringing his attention to bear on them, as an engagement is impending on the morrow.

He does not make them a subject of a special report, since the description of an area or position is generally complicated, and may be diffuse by reason of an inevitable lengthiness of style, and there is always the fear of saying too much or too little.

A topographic sketch of the position will equally make double work, for there is his map already freshly corrected. Under the circumstances, a panorama of each of the positions at *A* and *B* would be of interest, and produce the necessary information, in view of the probable engagement at one place or the other.

Returning towards *A*, he arrives at *C*, and he examines the ground from the enemy's point of view. It is more or less open, and besides, the map gives him a very fair idea of it. Under these conditions his sketch would be more useful if drawn facing the position, and, consequently, the enemy.

He halts therefore at the point *O*, where he can see the position from end to end, and draws his first panorama.

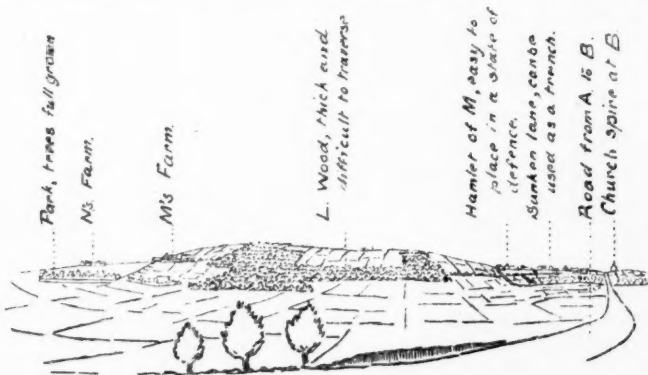


FIG. 21.

This sketch will not be drawn, as in the preceding case, on the same paper as the road report, but on a separate sheet, which will be attached to it. It carries a certain amount of detail, and requires more space for its execution in consequence, and should indicate the different military particulars that offer themselves in the present tactical situation (Fig. 24). The sketch will be completed by a few notes on the particular points he has remarked.

He then continues his way towards *A*, and arrives at the passage of the river *R*, opposite the second position noted.

All the interest is centred on the bank on the side *A*, which commands the other, and offers different accidents of the ground, which could be occupied with advantage in order to contest the passage of the river with the enemy. From the point *O'*, where he stands, the position is perfectly disclosed (Fig. 25).

On the other hand, the bank on the side *B* is open, and there is no cover from view or fire; it is therefore preferable to draw the

panorama of the position on the opposite side, as the enemy will see it while advancing towards A.

The second sketch is drawn in the same way as the first, with reference to the tactical idea, which is here the defence of the passage across the river, in which the details of the position, suited to the part they have to play in the combat, will be shown distinctly (Fig. 25).

Care would be taken to show the bearings of the two panoramas, with reference to the road, by means of the visual angles (Fig. 23).

It will very often happen that there will not be enough time to produce completely finished sketches, as in Figs. 24 and 25; for this reason it is always essential to commence with the important details from a tactical point of view, such as lines of fire, edges of woods, hedges, walls, banks of rivers, valleys, outlines of ridges, etc.

An unfinished sketch, so far as the drawing, properly speaking, is concerned, but complete in outline, can easily be finished up on return from the reconnaissance, if before leaving the ground it is carefully examined and committed, in a measure, to the memory.

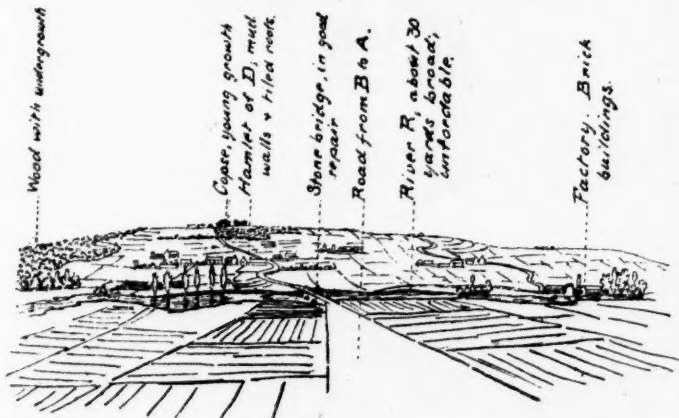


FIG. 25.

Type of Outlined Pictures to be Used on a Night March.—To get one's bearings and recognise one's position by night is a much more difficult and ticklish matter than by day. A report on a route to be followed by night can be enhanced in value if certain landmarks on, or quite near, the road are faithfully drawn in outline and placed alongside a scale according to their corresponding distances in the margin (Fig. 26).

Type of Panorama in the Reconnaissance of an Artillery Position.—This is a case in which a panorama has a distinct value; for, in giving a clear idea of the landscape, one is enabled to form an opinion of the value of this or that artillery position.

In sketching, the point of view would be chosen somewhere in the line to be taken up by the guns.

In the middle distance, care will be taken to indicate any dangerous points where hostile infantry might obtain cover to bring

effective fire to bear on the guns; or where, on the other hand, the escort to the artillery could with advantage post themselves.

But the greatest interest of such a panorama would, of necessity, lie in the background. Easily distinguishable landmarks to range on must be made to stand out in the sketch, and their distances judged, or measured off a map. The outline of such ridges as the enemy may make use of as artillery positions will be clearly indicated and their ranges noted.

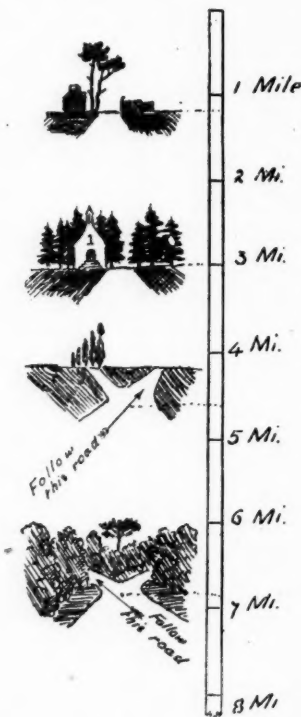


FIG. 26.

Panorama of Outposts.—When the disposition of the outposts and the nature of the country lend themselves, a panorama illustrating and explaining a report on an outpost line is very useful. It allows one to judge at a glance the soundness of the dispositions and, in a certain measure, the value of the line of resistance.

If possible, the sketch should be drawn from a point in the line of resistance where the artillery would be placed, if there is any, for it is from such a point that the best view would be obtained.

It will be necessary to indicate the general nature of the ground, the stretches of open space, and those of which the view is, on the contrary, more restricted, the lines of communications, and finally, the positions

of the picquets, supports, reserves, etc., as well as the successive lines where they can resist (Fig. 28).

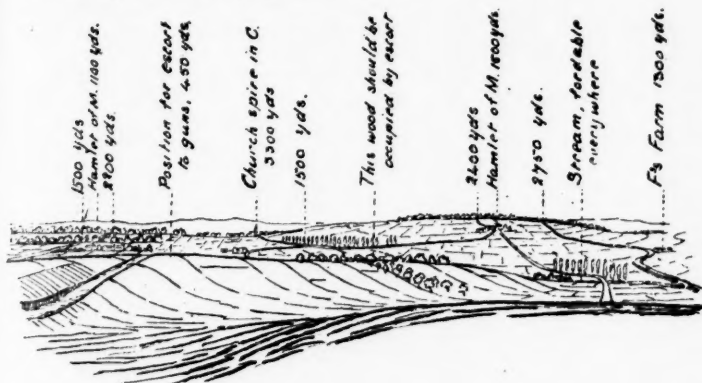


FIG. 27.

As an outpost line is generally disposed over an extensive stretch of ground, one panorama could not include the whole line. A series of successive panoramas would, therefore, have to be drawn and placed alongside one another, and perhaps sketched from different positions.

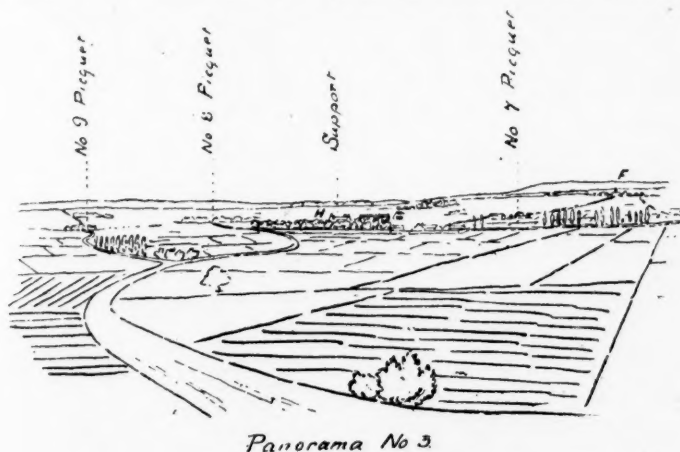


FIG. 28.

Their point, or points, of view and bearings will have to be shown on the sketch map accompanying the report, or, in default, a rough plan attached to the sheet on which the panorama is drawn (Fig. 29).

A Sketch Made with the Aid of Field-Glasses.—Circumstances will often occur where the presence of an enemy will prevent an approach to

a position which it would be interesting to reconnoitre and study from a closer point of view.

Nevertheless, useful information can be brought back from such reconnaissances, which will be in the form of enlarged sketches made with the assistance of field-glasses or a telescope.

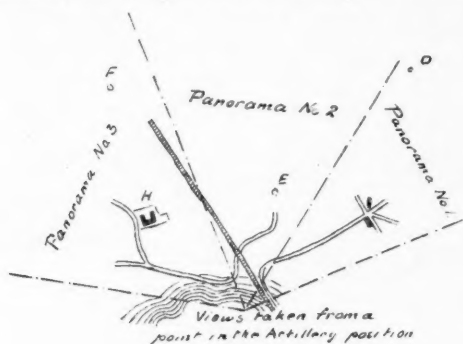


FIG. 29.

Let us imagine the reconnaissance of a coast for the purpose of choosing a point for the disembarkation of a force taking part in a



FIG. 30.

combined action by land and sea, against the port A (Fig 30). The point B seems to realise the conditions required, and an officer is

ordered to reconnoitre and report on the tactical possibilities of the enterprise. Amongst other considerations, he will have to carefully appreciate the value of the positions which surround the beach:—

1. From the point of view of their accessibility, and the facilities for gaining a footing on them.
2. In that which concerns their defensibility against attacks by the enemy, since they have to constitute a primary base of operations.

This will necessitate a careful study of both the eastern and western slopes of the ridge *C*, and of the point *D*, which forms a salient where the leading boats would land the covering troops.

To record the observations which will give an idea of this inaccessible ground, but which can nevertheless be searched with field-glasses, the most practical method will be a series of panoramic sketches executed under the following conditions.

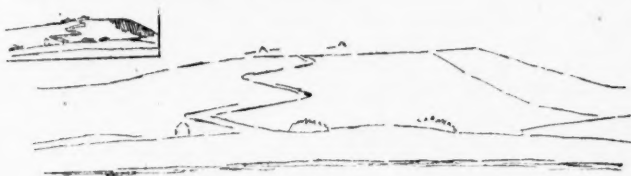


FIG. 31.

First of all, a rough and lightly drawn sketch of the land, as seen with the naked eye, will be executed, showing the general outlines. This sketch (Fig. 31) must be sufficiently large to allow the details to be clearly filled in when distinguished through the glasses, beginning, in preference, with the foreground (Fig. 32).

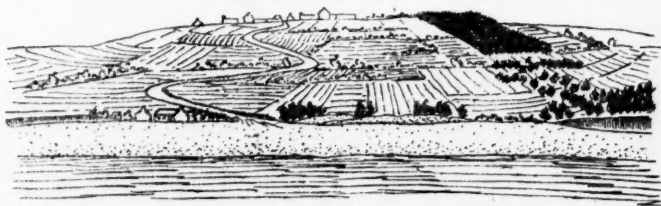


FIG. 32.

These figures should explain themselves. The small sketch in the left hand above Fig. 31 is the land as seen with the naked eye, and that below it the outline sketched therefrom, as mentioned above. Fig. 32 is the outline filled in with the detail, as seen through the glasses.

It cannot be denied that this kind of work is very trying to the eyes and attention, and it must therefore be strictly limited in only noting that which is necessary. In return, it is a method that can be carried out in comparative safety, and permits the collection of information which it is essential to know.

From a study of the panorama of the beach *B*, Fig. 32, it can be realised:—

1. That, to oppose the landing, the enemy could occupy a commanding position on the ridge *C*, which appears to dominate the beach *B*.
2. That, close to the shore, the assailant could find comparative cover behind the farm *E*, the little cliffs *G* and *I*, and the sandhills *H*, whence he could reply to the defenders' fire; that he will have during his advance a series of fences favouring his forward rushes; that the position *C* seems rather approachable by its left flank, under cover of the fir wood; and, finally, that a cart road leads from the beach up to *C*, which will allow the guns to be taken up to the position when it is eventually gained.

In the same way other panoramas of the rest of the coast line to be reconnoitred will be drawn, and the tactical conditions considered.

This method of sketching an inaccessible position with the aid of field-glasses of course holds good on land as well. Such a sketch, under the circumstances, is of as great a value as a simple written report.

The Rough Sketch.—The various figures and panoramas illustrating this work are completed sketches and finished in ink; under these circumstances they give no idea of the preliminary pencil work, or rough sketch, that is to say.

Sketching in the field is not the same thing as sketching on a table indoors; it has not the same ease and facility. It is best, therefore, not to finish the sketch in the field, but only to draw the main outlines of the general features and details, and finish the sketch either in pencil, ink, or colours, or any combination of the three, on the return from the reconnaissance.

Let us consider the best form in which to carry the drawing paper. Panoramas are generally greater in their lateral extent than depth, and therefore the following appears to be the best size for the paper—a sketching block in the form of a book, about twelve to fifteen inches long by four to six inches broad, the leaves of which are easily detachable. Where two or more panoramas, forming a continuous landscape, have to be joined together, the best medium for this purpose is the adhesive linen tape for repairing music.

To save time in the rough outdoor work, the sketcher should make use of a series of conventional forms for all the common and constantly recurring objects he sees, such as houses, walls, farms, hedges, roads, etc. The following illustrations (Fig. 33) will give some idea of such conventional time-saving forms.

The features of the ground should be hinted at, so to speak, in the rough sketch, and, having carefully observed them, they should be carried away in the memory and fully worked up in the finished sketch.

Memory for lines and forms will be easily developed under the conditions of constant observation, and a few strokes will suffice to clearly recall the impressions received during the work in the field.

Panoramas Finished in Colours.—Panoramas gain in clearness if they are finally touched up with coloured chalks. An ordinary sixpenny box of 12 coloured chalks, that can be obtained at any stationer's, is quite good enough for the purpose.

Colouring the detail of a landscape, in a more or less conventional way, will make the various objects stand out more clearly than if left in pencil or ink. The colours can be added after the sketch is finished, if time permits. The following would be somewhat the conventional use of the colours for the different objects:—

Burnt sienna for the ground and roads; green for vegetation; yellow, with a dash of brown in it to tone down its brightness, for cereal crops; blue for water; red for houses, walls, and brickwork generally; and purple for heather.

A faint dash of blue over the backgrounds will produce the hazy effect of the far distances. It must be borne in mind that these colours

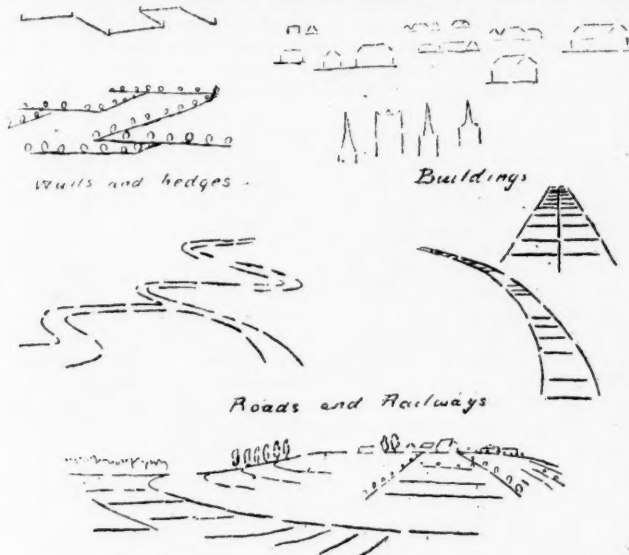


FIG. 33.

as they approach the foreground ought to be laid on stronger, and thus the general effect of perspective will be maintained throughout the sketch.

Water-colours also have their uses in panoramic sketches where there is leisure, and the importance of the sketch make it worth while.

But they must not be used with the idea of producing an artistic effect. Their utility, as with coloured chalks, consists in bringing out with clearness the detail of the pencil or ink picture.

It goes without saying that the painting is not to be done out of doors; only the sketching with the pencil as exactly as possible. The sketcher will be content in observing and carrying away in his memory the general tones of the landscape.

As no one would undertake the work of painting a panorama in water-colours unless he was thoroughly acquainted with the art, it is unnecessary here to give any hints on their use. The only point to

remember is to produce a faithful picture of the landscape rendered in general tones, as under a diffused light.

It would be as well, after the colours have dried, to go over the picture again with the pen, and bring out any details that may have become lost in the process of painting. Perhaps the artistic effect may lose by this, but the military picture will gain.

The Panorama Applied to Orders and Instructions in the Field.—

It will often happen that orders, etc., in the field will gain in clearness, and be more quickly grasped and understood, if illustrated by a freehand sketch of any particular piece of ground or country mentioned in them, either with reference to a map, or when no map is available.

Such orders might be in connection with a march to a certain point or in a certain direction; with an attack on a particular position or locality; with instructions issued to artillery to take up a position on a previously chosen point, or directing their attention to a particular target to fire on.

It is one thing to be ordered to go to a certain point marked on a map, and have to try and recognise that point in the country after referring to the map. It is another to have a picture of the country handed to you with the particular point marked on it, and be able to recognise it at once and pick it out of the landscape. There is no doubt or hesitation about this method.

NOTE.—Just after I had finished this work, I was shown some panoramas that are to be used as illustrations in the Official Account of the War in South Africa. They are the work of the late Captain Erskine, of the Field Intelligence in South Africa. As examples of how military panoramas should be drawn, they are very instructive. In their faithful reproduction of the landscape and clearness of detail, they leave nothing to be desired, and will prove very useful in enabling the reader to appreciate the nature of the country over which certain operations were conducted.

MOUNTED INFANTRY MAXIMS.

BEING NOTES BASED ON ACTIVE SERVICE EXPERIENCE

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I.—MOBILE INFANTRY.

EVERYONE recognises what an important factor in war is speed, and that a mobile force can oppose successfully a much larger one of slower movements. To be able to transfer rapidly a large body of infantry from one flank to the other, or to throw such a force 30 or 40 miles forward in a night in support of cavalry, are very apparent advantages, though only two of many which might be quoted.

The idea of imparting mobility to infantry is not a new one. Long ago brakes and other vehicles were suggested as means of conveying infantry, while the present Dragoon regiments were originally a species of mounted infantry.

Mobile infantry can be divided into three classes:—First, infantry conveyed on wheeled vehicles; secondly, those mounted on bicycles or tricycles; thirdly, mounted infantry proper, *i.e.*, infantry mounted on camels, horses, or cobs.

It is with the third kind that we have to deal: but we may do well to touch on the first two and compare all three.

Troops moved by train have on occasions tactically come under the head of mobile infantry: *e.g.*, the infantry were moved out from Ladysmith actually on to the battle-field of Elandslaagte by train. Infantry carried on motor cars have not yet been tried; but an attempt at this mode of conveyance may be expected shortly. Wagons drawn by mules were used in the late war to carry infantry, and were found most useful. To quote one example:—General Hart, in his forced march on Potchefstroom mounted two companies of infantry on mule wagons and sent them in support of his mounted troops, completing 39 miles in one night. Towards the latter part of the war, where columns consisted chiefly of mounted troops, the few infantry retained for outpost purposes were frequently carried on mule wagons, to enable them to keep up with the mounted troops, and not impair the mobility of the column.

As occasion demands and opportunity offers, infantry can always be put on empty supply wagons, and be carried thus from one point to another; but the clumsy nature of a column of wagons (and even motor cars), which are necessarily confined to good roads, makes it very doubtful if these will ever be generally used as a means of imparting mobility to infantry.

Cyclists have formed a separate arm in our Army for some years. Where good roads are plentiful, their use and importance are indisputable; but these again are almost entirely confined to the road; while a wise and plentiful distribution of tacks, glass, or barbed wire by the enemy would seriously impede their progress.

On the other hand, mounted infantry can move over the same ground as cavalry, and are, therefore, more suited to support them. They can even supplement cavalry, and be used independently. Their only disadvantage—from which the other kinds of mobile infantry would not suffer—is the fact that, when in action, one quarter of their fighting force must be used as horse holders, and only three-quarters be placed in the firing line. It is hoped that this disadvantage may be overcome—at any rate, upon occasions—by a good system of “linking” horses. Experiments have, I understand, been lately made in this direction at Aldershot.

II.—RÔLE OF MOUNTED INFANTRY.

It may be argued that cavalry armed with the rifle serve the purpose of mounted infantry, and that the raising of fresh cavalry regiments would be better and less confusing than inaugurating a new arm. It is even suggested that cavalry as such is no longer needed, and that mounted infantry, under the name of cavalry, is the only form of mounted troops required. Those, however, who are not blinded by the exceptional fighting in the Boer war still maintain that so long as armies fight on *terra firma* the shock tactics of cavalry will be needed. Whatever may be the correct opinion, until our cavalry are deprived of their present rôle, the duties and training of cavalry and mounted infantry must be kept distinct.

Mounted infantry, to be of any use as such, and in every way preserve their infantry characteristics, must look upon their horses as a means of conveyance only, and must be trained to fight dismounted. Their duties are many and varied; but it is a broad principle that they should be used whenever it is important to occupy positions where the distance and the rapidity of motion required prevent dismounted infantry doing so.

With a large army conducting extensive operations, the mounted infantry will act as a support to the cavalry. Marching behind the cavalry screen, they will be ready to seize defiles, bridges, and other tactical positions, and prevent their occupation by the enemy until the infantry arrive; to cover the advance, and, if necessary, the retirement of cavalry. They would form rallying *points d'appui* for the cavalry. They will also take part with the cavalry in wide turning movements. Formed as a separate body, with machine guns, and possibly artillery, they may help a flank attack by working round to a position from which they can enfilade the enemy. They may be used in large, independent bodies for reconnoitring on a large scale, especially if cavalry are not available, or for raids or operations against an enemy's communications, as in the American Civil War. They would require to be good mounted infantry to do this independently.

When forming part of an attacking force, mounted infantry may be used, when necessity demands, for rapidly reinforcing points in the

attack.¹ Their true rôle, no doubt, will be to protect the flanks of the attack, and harass those of the enemy. In modern warfare a position is won by superiority of fire, and the result of the action is, as a rule, decided long before the attackers come within charging distance of their opponents. The attack will be carried out in somewhat the same way as the siege of a fortress. Instead of parallels, however, the infantry will use the natural positions and cover afforded by the ground, from which they will endeavour to overcome the fire of the enemy. The main attack, if possible, will be on the flank, a force holding the enemy's front. The mounted infantry will fulfil their duties by taking up suitable positions whence they can bring to bear enfilade and reverse fire at medium ranges on the enemy's position. They will be also ready to oppose any counter-attacks, and support the cavalry in the pursuit.

The duty of mounted infantry in the defence will be to oppose the enemy's mounted troops, and force them to deploy. They might, first of all occupy positions masking the true position, and, when driven from these, extend to the flanks, and by skilful manœuvring prevent the enemy from finding the true flanks of the position. They will also, with the cavalry, make counter-attacks, seizing rapidly—perhaps only for a short time—positions enfilading the attacking line. Well and daringly handled, the mounted infantry might be the means of saving a weakly held position. In case retirement were necessary they would, with the cavalry, cover the retreat.

Finally, there will be many occasions when mounted infantry will have to work without cavalry, and even alone, and must necessarily do their own scouting and perform the duties of advance, rear, and flank guards. But these will be dealt with later.

III.—QUALITIES AND TRAINING OF THE MAN.

To make a good mounted infantry soldier, a good infantry soldier is required. He must feel that fighting dismounted as infantry is his natural rôle. Secondly, he should have a share of common sense—without which it is impossible to teach a man to be of any use in a branch of the Service which requires as much, if not more, individual intelligence than any other. Thirdly, he must be a good shot, and should have come out well above the average in his infantry musketry training. It is of little use going to the expense of giving mobility to infantry who cannot shoot. Fourthly, the man chosen for mounted infantry should be naturally fond of horses. Mounted infantry are only useful as such as long as their horses are in good condition, and all the training in the world won't teach a man to look after his horse properly unless he is naturally fond of it.

1. *Riding*.—Having got this article, the first thing is to teach him to ride. An ordinary course of Riding School will give him a

¹ A general officer of great experience with mounted troops in the late war, however, is opposed to this theory. He does not believe in the possibility of perpetually shifting mounted troops from one point to another of an attack on a probably restricted field of battle.

tolerable seat and ability to guide his horse sufficiently to enable him to take part in simple tactical exercises.¹ He need not be a first-class horseman, but he must be adept at mounting and dismounting, and must be capable of leading three horses of not too lamb-like disposition at the walk, trot, and gallop. Perfection in these exercises can be got by constant practice, and—where active experience is the *sine qua non* in all other branches of the training of mounted infantry—this at least can be learnt in peace-time.

2. *Care of Horses.*—But more important than riding is the art of, looking after a horse. Anyone who has commanded a mounted infantry company or section in the field has had to deal with the man who is always requiring remounts, who kills in a very short time every horse, however promising, entrusted to his care, and, *vice versa*, with the man who by constant and fond care keeps his charger fit through a long campaign. These are extremes. The average man is fond of his horse and anxious to look after it, but in time of hard work, by sheer stupidity or carelessness, knocks him up when quite avoidable. We teach our mounted infantry soldier that his horse is a means of locomotion. It is very hard to make him understand that it is also an animal, and requires careful husbanding.² Strict discipline in the grooming, feeding, and watering of horses in peace-time will double their chances in war. But it is to the watering that the greatest attention must be paid. On active service the grooming is under the supervision of section commanders, and the feeding depends on the commissariat, but it often rests entirely on each man when and how his horse is watered. When practicable, the horses of a company should be watered together under the supervision of an officer; and even where men are scattered as scouts for the whole day, the officer commanding the section to which they belong should make a point of seeing that horses are watered properly and at the right times. Even old soldiers, when this important duty is left entirely to them, will persistently give their horses a bellyful of water before sunrise or a long gallop, and allow them only a sip, or fail to water them at all on coming into camp.

It is most important also that men should learn to save their horses in the field. The soldier, as a rule, knows no pace between a slow walk and full gallop, except when under the direct command of an officer. Unnecessary galloping when hard work is likely to be required not only shortens the life of the horse, but may also mean the life of the rider, when later on he depends on the speed of his charger for safety.

3. *Shooting and Use of Cover.*—We have taken it for granted that the man to be trained for mounted infantry is a good shot, but as this branch of his training is of such vital importance, no pains should be spared in perfecting him. It is essential in mounted infantry that every rifle be used with intelligence, and that every man be a "sporting shot." There is an art in individual musketry, and there are qualities necessary for a good "active service shot" which perhaps sportsmen can best understand.

¹ It is thought by some of the best authorities that the mounted infantryman should be able to ride as well as anybody else, and they disapprove of the theory of his being merely a passenger on the horse.

² A bad rider does infinite damage to his horse.

In peace practice a man with a good eye and a steady hand can perhaps make a possible at 500 yards; but in action, when nerves are highly strained, when the target is a moving one, or seldom visible; when, each time the man lifts his head, the whistle of the bullets unsteadies his aim, all his target practice will be as nothing without nerve. Discipline and confidence in his weapon, which alone can strengthen this quality in those who have it, and impart it to those who have not, are the first qualities necessary for the active service shot.

In actual training the man's powers at judging distances must be perfected by constant practice. A good shot is of little use if his sight be elevated 200 or 300 yards too much or too little. Vanishing and moving targets at unknown ranges are the best means of improving a man's shooting in peace-time, and practice at these should be very frequent.

But though a good shot, a man would not remain long of much use under heavy fire, were he not also proficient in the art of finding cover and of using it. An officer can direct his men to, say, a line of rocks, but he cannot choose each man's cover. The man must learn to do that himself. He must know what is cover, and what is not: how fatal it is for men to crowd behind one rock or mound: how it is often better to lie in the open than behind a piece of imaginary cover, which only serves as a target to the enemy: how slight folds in the ground, though scarcely perceptible, are yet good cover: and how even cover from view is sometimes useful when men are well scattered. The use of the cover is almost more important. A man must be taught by a careful peep to choose his object and, loading his rifle, to shoot round or over his cover, exposing the minimum extent of his body for the minimum space of time. At close ranges this art of combining the use of the rifle with that of cover will be found invaluable. There is one important point which touches upon firing exercises. Whether firing volleys, or independent, men should be taught after firing to come down to the ready *and load* without any further word of command. Whether there be a cartridge in the chamber or no, the motions of unloading are always gone through after "Cease fire" has been ordered, so that there is no danger on this score, while often a good chance at a quickly passing object will be lost through the men not being ready.

Before leaving the subject of musketry, we might touch on the much discussed advantages and disadvantages of men firing and holding their own horses, or firing off their backs. Neither practice would, of course, be resorted to if time and ground permitted of horses being put under cover; but in the field the cases are innumerable where the waste of time in handing over horses and getting them up again is fatal, especially where a line is much extended: while the advantage of the men being able to dismount, fire a few shots, jump on again, and resume the advance or retreat, is incalculable. Firing on horseback is rarely of any advantage, and is generally as dangerous to friend as to foe. There have been occasions, however, where a few men firing back off their horses have induced a timid enemy to imagine that there were still some men dismounted and perceptibly checked the pursuit.

4. *Scouting.*—A perfect scout is born, but not made. The average man, by long active experience, can be turned into a fair scout; but it is very hard in peace-time to train a man to be of any real use in war. The knowledge that a real enemy is near, and the

possibility of personal danger are so essential to the training of the man that on peace manœuvres we can only hope to teach him to be a slightly better scout than he would otherwise have been.

The first thing in training a scout is, of course, to impress him with the importance of his duties, and that on his vigilance depends the safety of those behind. Constantly on the alert, he must expect the enemy, and learn to anticipate every possibility. This does not make him "jumpy," but, on the contrary, gives him confidence: for in a sudden emergency, instead of being taken by surprise, he has already decided what to do. In scouting, a man must depend entirely on his eyes and intelligence. His eye must be trained to detect instantly any object, moving or stationary, near or far, and his intelligence must enable him to reason in a moment what it means. He must watch his front, but also his flanks, and use his eyes not only to detect and follow movements of the enemy, but to watch carefully the movements and actions of his supports and main body, and regulate his own movements accordingly. An eye for country is difficult to acquire, but by constant practice a man can be taught to pick his way across country so as to see and not be seen, to know what is commanding ground, and where he will get a good view, and to remember the ground he has already crossed, and to mark out in his mind the best way for a rapid retreat should such a course be necessary. He must be taught to scout well out, but according to the nature of the country regulate his distance from his support and from the scouts to his left and right.

Reports of scouts are nearly always verbal, and a man should be able to give them clearly and intelligently. He should never report until he is quite certain of what he has seen, and has made up his mind what to say. Having decided to report, he should waste no time about doing so. In emergencies, where the enemy is close at hand, and it is important that he should not go back, the scout may shoot to give the alarm, and by riding one way or the other indicate the movements of the enemy.

5. *Cossack Posts*.—Closely allied to scouting is the duty of cossack post, or vedette, which frequently falls to the lot of mounted infantry. These generally consist of a non-commissioned officer and 3 men, but as often as not an old soldier is placed in command. The duties of the cossack post are the same as those of a "group" in an infantry piquet, but a mounted post is, as a rule, so far from camp that a great deal more watchfulness is required. If the post is put as far as possible in a state of defence, the fire of 3 magazine rifles, made the most of, may seriously delay the advance of a large party of an enemy. The commander must clearly understand his orders, whether he is to retire or be reinforced on giving the alarm, and must be particularly careful that he cannot be stalked and that his line of retreat is open.

IV.—QUALITIES AND TRAINING OF OFFICERS.

Much more so than in infantry the good condition of a mounted infantry corps or battalion depends on company and subaltern officers. Mounted infantry are frequently so scattered that on section commanders great responsibility rests. The officer for mounted infantry must therefore be carefully chosen. Like the private, he must be thoroughly grounded in infantry work, but must be picked for his

intelligence and keenness. He requires a great amount of common sense, and should be willing and capable of taking the greatest responsibilities without hesitation. He must be anxious to study his profession and be possessed of initiative, dash, and courage, tempered with wariness. The better horseman, and the better horsemaster, the better mounted infantry officer he is likely to be, while a natural eye for country is most necessary.

1. *Care of Men.*—In mounted infantry fighting the occasions are many where a great deal must be asked of the men, where their confidence in their officer must be severely put to the test. A risky dash for a position, which the enemy may reach first, or the necessary retention of a rear-guard position, when isolation is almost certain, are two cases on which, perhaps, the safety of a column or convoy might depend. The men, to do this, must have confidence in their officer; they must feel certain he will get them out of any hot corner if it be within the bounds of possibility. It is to this end that mounted infantry officers should be so careful to look after the comforts and interest of their men, see that they are as well fed as possible, and thus gain their love and confidence.

2. *Care of Horses.*—As regards the care of horses, short experience will enable an officer to gain sufficient rudimentary veterinary knowledge for the purpose. He must know the horses of his company or section, and by watching his men ensure strict discipline in the grooming, feeding, and watering of his horses.

3. *Drill.*—As mounted infantry have little to do with ceremonial parades, the drill is very simple. The principle that the few evolutions necessary rest upon is the division of each section into groups of four men, of which one is the leader and No. 3 the horse holder. That a company can form column of half companies or sections, reform into line or advance in column of groups without confusion is really all that is necessary in the way of mounted drill—simple infantry drill adapted for horseback. As has before been pointed out, the "dismounted service" drill is the one which requires most practice and precision.

4. *Control of Fire.*—A mounted infantry officer should have, and under the present regulations will have, gone through the course of musketry. Mounted infantry are so often fighting in such small numbers that the accuracy and direction of their fire is all the more important. Not only should an officer be a good shot himself, but in peace-time he should be thoroughly capable of instructing his men; on active service he should be able to direct their fire to the best possible advantage. Active experience, a knowledge of men under fire, and the effect of fire are necessary. It is easy under peace conditions to direct the fire of men on beautifully marked targets at fixed ranges. But under a heavy fire, where men are being picked off, and the shooting is wild and inaccurate, a complete control, and, therefore, a thorough knowledge of his men, is required before an officer can hope to turn the fire of his party to any good effect. The first thing is to steady the men, and to do this an occasional cessation of fire, followed by a few steady volleys, will be found most effective. The officer must also (cover being available) move along his firing line, seeing that sights are elevated to the proper range, and pointing out the object to be fired at. He must encourage his men, showing the good effect, even if only imaginable, of their fire. The heartrending discouraging part of modern warfare is the fact that,

however much and well you may fire, you rarely see any effect. By making the men believe that they are making good practice, the officer is certain to attain his object, *i.e.*, a steadier and better-aimed fire. A knowledge of the effect of fire will enable him to understand where and how to direct his fire; while thorough competence in judging distances is, of course, essential.

Because in the late war the Boers never employed volleys, people are inclined to think that they are obsolete. The chief arguments against volleys are that a man cannot take such good aim, and that when much extended—as is frequently the case—the direction of volleys is impossible. In scouting and skirmishing lines, in an extended line of attack or defence, and even in fairly close formation, when rapidity of firing is needed, independent fire must be used. But whenever a section or group of men can easily hear the word of command of one officer or non-commissioned officer, volleys, in my opinion, are preferable to independent. Firstly, they have a steadying effect; secondly, owing to this the fire is likely to be better directed; thirdly, it is more under the control of the commander, and, therefore, less ammunition is wasted; and, lastly, the fire can be more easily concentrated on one object. At night, in attack, firing of any kind should be avoided; in defence, volleys alone must be used.

5. *Patrolling.*—Patrolling is a duty on which an officer's capabilities are most severely put to the test. He has, as it were, to conduct his own little campaign, and often act entirely on his own responsibility. With a fair share of intelligence, and if he takes sufficient precautions and keeps his wits about him, he should find no difficulty in conducting his patrol with success.

The objects of patrols vary considerably, but the general principles for their conduct are nearly always the same. The first necessity is that the officer in command should see that he thoroughly understands his orders, *viz.*: the object of his patrol, the nature of the information required, the importance of this information, the risks he is to take, and the intelligence already at hand. He should then decide roughly how he is going to work. He should anticipate every possibility, and form a general idea how to meet each, and finally mark out in his mind the line of route he intends to take, either from his own knowledge of the country or from his map.

It is an infallible rule that however unlikely he be to meet the enemy, the commander of a patrol should take all necessary precautions against surprise. The number of scouts he puts out depends upon the strength of the patrol and the nature of the country; but he should never put out more than are absolutely necessary to cover his front, rear, and flanks, at sufficient distance to give him timely warning. The utility of a patrol depends largely on its handiness; so that the more compact the commander keeps his party the better. A scattered patrol is clumsy to manage and difficult to conceal.

Before sending out his scouts the commander of a patrol must make them clearly understand his intentions, and the direction he means to take, and must instruct them what action to take on suddenly meeting the enemy.

The patrol being in a handy formation, the necessary scouts well out in front, on the flanks, and in the rear, the next thing to decide on is the actual route to be followed by the main body. The party being small, and the warning the commander is likely to get of the enemy short, he must always be within easy reach of some defensible

position, and so it is necessary that he lead his patrol on or near high ground, at the same time keeping it as concealed as possible. When his route necessarily crosses low and disadvantageous ground, he must span it as quickly as possible, and never halt in it. Woods, defiles, etc., should not be too closely approached by the patrol until searched by the scouts, the former waiting on commanding ground during the operation.

But halts should, if possible, be avoided. The success of a patrol often depends on its rapidity. It must get the information required, before the enemy knows it is seeking it, and delays are therefore frequently fatal.

The distance a patrol goes depends on its orders, the time available, or the condition of their horses, but if entirely at the discretion of the commander, he should if possible not return until some sort of definite and useful intelligence be gained.

On meeting the enemy, the patrol either drives him back, attempting to take a few prisoners, or, if the enemy be too strong, retires, avoiding the loss of prisoners to its opponents. The commander must in any case decide at once what to do, and act promptly on his decision. To do the wrong thing with decision and promptitude is better than to do the right thing hesitatingly and too late. Even if the enemy be too strong to drive back, the commander, by showing a bold front, should draw as much fire and gain as much information as possible, keeping, however, on advantageous ground and watching his flanks carefully. Should he find the enemy threatening his line of retreat, he must not hesitate to gallop without regard to formation or order, provided he has made arrangements for a rendezvous near camp.

In giving his report—as a rule, in writing—the commander must be careful to report only what he has actually found out, and avoid mixing his own conclusions with actual facts.

V.—MOUNTED INFANTRY COMPANY IN ADVANCED, REAR, AND FLANK GUARDS.

The duties of covering the front, rear, and flanks of a column frequently fall to mounted infantry. An officer in learning to handle his company in the performance of these duties, will be learning the general principles of all advanced, rear, and flank guards. Every officer has his own particular way of disposing his company on these duties. One way may be as good as another, but in all the principles are, or should be, the same.

1. *Advanced Guard.*—Of the three duties, that of advanced guard allows of most latitude. The officer commanding has to find the enemy, and at the same time protect the front of the column, while it rests on his decision chiefly whether on meeting the enemy he pushes on or awaits the arrival of the column. But protection is his first duty. He must not allow himself to be led into pursuit of an enemy, and so lose touch with the column.

Before taking his company out the officer commanding should first make sure that he thoroughly understands the object of the officer commanding the column, the direction he means to take, and the intelligence at hand.

The advanced guard as a rule acts on the offensive. A timid advanced guard is of little use; while dash will often deceive an enemy

and induce him to quit a position which, if held, would have delayed the column. To guard against surprise and to try and find the enemy are its primary duties; and having found the enemy, it must drive him back or hold him, according to his strength.

In making his dispositions the officer commanding must bear in mind two things—the safety of the column, and his own safety. He must cover the front of the column at such a distance as to prevent the enemy sniping it, and to give the commander sufficient warning to make his dispositions for attack or defence. He must be well forward, so that if hard pressed he can give way a little without retiring on top of the column; but must avoid being so far ahead as to risk being cut off or defeated before the column can come to his assistance.

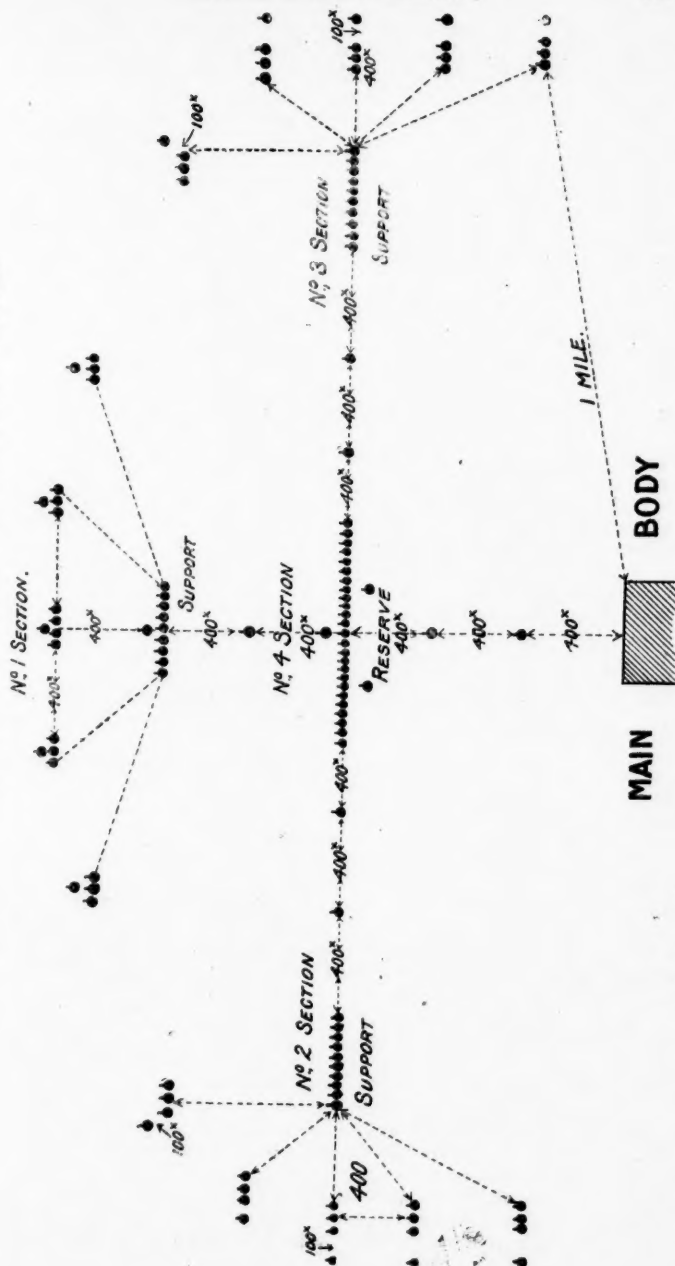
The advanced guard must be a fighting line, and not merely a line of skirmishers, and the officer commanding, being responsible for his own safety, must see that his flanks are secure. With these objects, a line of formed bodies, strong at each flank, supplying their own scouts and with the necessary supports and reserves, according to the number of troops available, is the best disposition. In the case of a company, one section would march along the line of route, one well out on either flank, and one in support. The centre section, in open ground, would march intact, sending out a few scouts, who would be responsible for the ground between the two flank sections. In close country, it would be necessary to spread this section out in skirmishing order, and keep the supporting section closer at hand. The flank sections give strength and security to the advanced guard. They would keep on the high ground, ready to take up positions defending the flanks of the advanced guard, but they should also be prepared to outflank the enemy should he oppose the centre section. It is a good rule that, when one part of the advanced guard is checked, the rest of the line should move on until checked themselves, or able to threaten the flanks or rear of the enemy. In this way the strength of the enemy can be more easily judged, while it prevents the possibility of a small patrol of the enemy bluffing the advanced guard into delay. These two flank sections should find one or two scouts in front and one or two on the exposed flank.

The officer commanding company would, as a rule, be with the supporting section, which he would lead, not necessarily in rear of the centre section, but on some ground whence he could see and be within easy reach of all three sections.

The officers commanding the advanced sections, on meeting the enemy, must act on their own initiative, as delay generally mars success, and is sometimes fatal. They should, however, as far as possible, conform with the general plans of their company officer and with the movements of the other sections. Whenever a company is split up, as in this case, the commanders of the several parties should be able to fight independently and yet in unison, without the necessity of laborious signalling. Like the combined play in a game of polo, it is at first difficult and confusing, but after experience becomes instinctive, and officers who can do this have reached a perfection of training.

2. *Rear Guards.*—Rear guards have but one object, that of protecting the rear of the column. But if simpler in this respect, it is a duty which is far more trying on the nerves than advanced guard. The fact of retiring from the enemy, and that the column is ever moving

ONE COMPANY MOUNTED INFANTRY AS ADVANCED GUARD.



away from the rear guard, has a distinct demoralising effect on all concerned. But to those who understand rear-guard fighting, it is most interesting. A successfully and skilfully conducted rear-guard action is almost more satisfactory than the most complete victory.

Though the rear guard is strictly on the defensive, skilful dispositions and a bold front will often deter an enemy from pushing home what would have been a successful attack, or at any rate one which would have delayed the column.

Much more so than in the case of an advanced guard, the rear-guard must be a fighting line, with strong flanks, ready at any moment to resist a determined attack. The dispositions suggested for an advanced guard, if reversed, serve admirably for a rear guard. Three sections would be in rear, the outer ones well out covering the flanks of the rear guard and in touch with the flank guards of the column. Each section would find its own scouts, and the supporting section would move on convenient ground some distance nearer the column.

When the enemy is threatening, the rear guard must always be ready to fight. It is well, therefore, to halt on good positions, and when the rear of the column has receded sufficient distance to move rapidly to the next, which would have already been decided on in the mind's eye. The conducting of a rear guard becomes, then, the art of quickly choosing defensive positions, each of which should be so occupied (the men not necessarily handing over their horses, unless fighting be in progress or imminent) as to obtain the most effective fire. As each section, the flank sections in particular, must necessarily often choose their own positions, the art of instinctive co-operation is almost more important than in the case of an advanced guard. The centre section must choose the best ground covering the centre of the column. The flank sections should find positions covering the flanks of the rear guard, and should be quick to discern and occupy ground, from which they can bring a cross or enfilade fire to bear on the enemy. At the same time they must be careful not to be so far out as to risk being cut off.

All sections in choosing their positions must find good cover for their horses. This is almost a *sine qua non*. The loss of the horses of one party often involves the whole column in an action for their extrication, when such an action is disadvantageous to the general plan.

The distance between the rear guard and the rear of the column depends upon the distance between one position and the next. The column should always be well clear of the second position before the rear guard leaves the first, and should never be within sniping distance of the enemy. Similarly the order in which the several sections retire depends upon the nature of the ground and upon which portion of the position must be held longest.

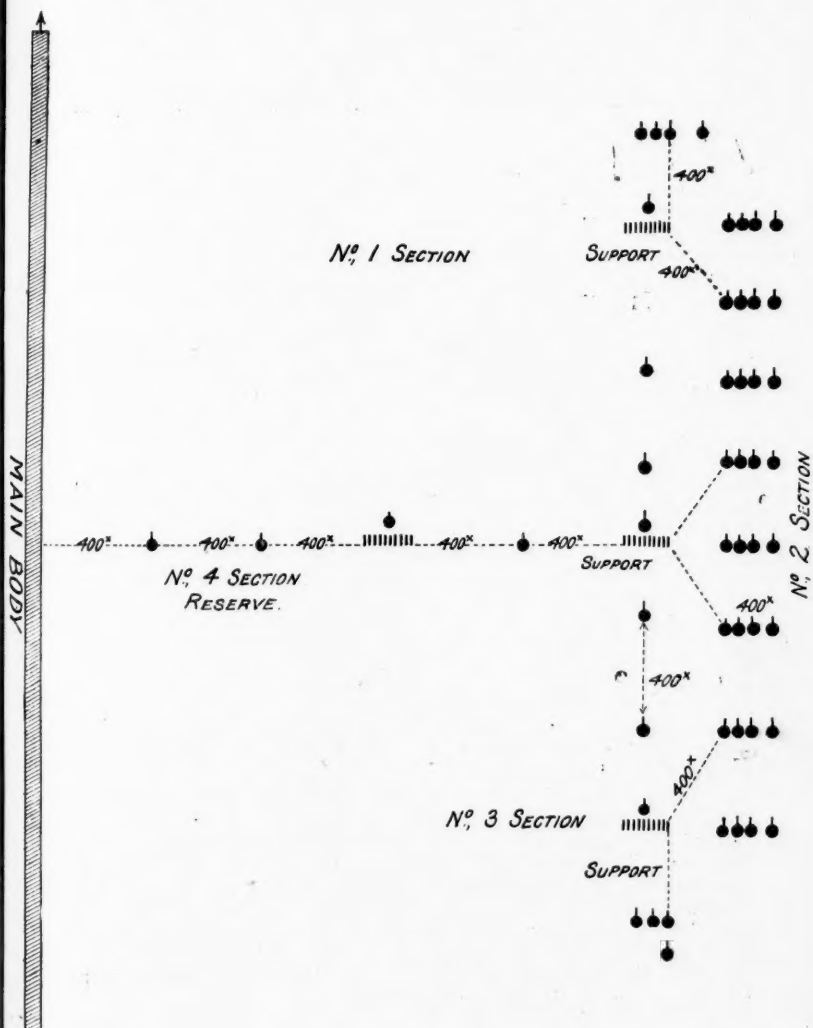
In a heavy rear-guard action where part of the column is engaged, the retirement from one position would be covered by troops holding another in rear. A party of mounted infantry might well form the extreme rear party in a rear-guard of all arms.

In the actual fighting the steadiness and combination of the fire of the whole line are most important. When a retirement has been decided upon, the movement should be carried out as quickly as possible. Men must mount under cover if practicable, every care being taken to conceal the retirement, and confusion must be avoided. Led horses should therefore be as close at hand as the nature of the ground permits, and should be under the charge of a thoroughly reliable officer

ON

MAIN BODY

ONE COMPANY MOUNTED INFANTRY AS RIGHT FLANK GUARD.



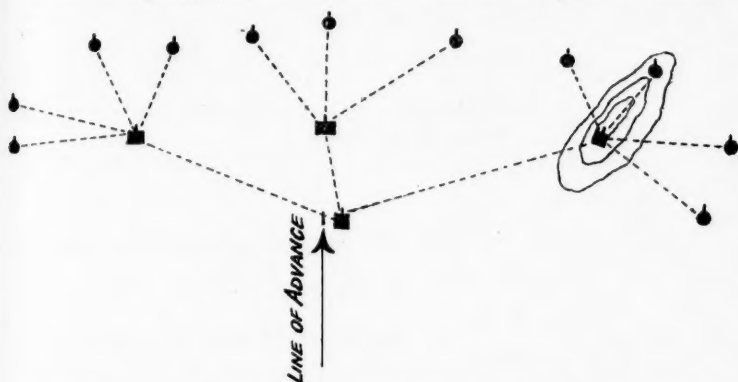
or non-commissioned officer, however much needed he may be in the firing line. If circumstances allow, the men should be roughly formed up before starting, and the retirement should be carried out at a steady trot, the men extended, but not out of hand. When the retreat is very rapid and under fire, the officer must discard all false sentiment and ride ahead of his men, so as to rally them at the next position. There have been many cases where the officer, by staying to see the last man mounted, has lost his section for the rest of the day. A hot and long rear-guard action so certainly brings confusion unless sections and other units are kept together, that it is of the utmost importance that officers commanding small units labour to keep them intact as fighting machines.

3. *Flank Guards*.—The flank guard should be a fighting line extending from the flank of the advanced guard to the flank of the rear guard. The company would be split up into a certain number of small parties, generally about half section each. The leading half section would be under the command of an officer, to whom would fall the responsibility of choosing the exact ground over which the flank guard is to march, the rear parties following at such intervals as the length of the column and the strength of the flank guard allow. The intervals, however, should never if possible exceed 1,000 yards. Each party would supply its own flankers, and should keep touch by the front or rear, according as the enemy is threatening the advanced or rear guard.

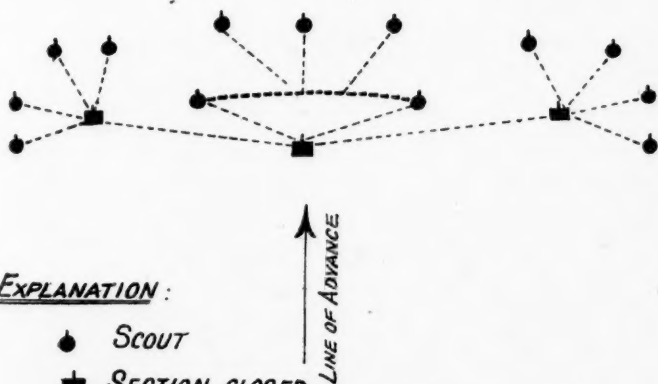
The whole difficulty rests with the leading party in choosing the line of route. The officer in charge of this party, in planning his route, has four conditions to fulfil. Firstly, he must always be moving on ground which covers the column and admits of defence and a good view. Should he be obliged to cross disadvantageous ground he must do so quickly. Secondly, he must not be so far out as to risk being cut off or defeated before assistance can come up. Thirdly, he must avoid marching within range of commanding ground on his exposed flank, and must either move over this ground himself or, if permissible, move nearer the column. Fourthly, he must keep touch with the flank of the advanced guard. The route of the flank guard will consequently not be necessarily a straight line or parallel to that of the column. At one time a high hill or good position will admit of the flank guard being close in; at another it may be necessary for it to move some miles out. The rear party have but to follow, keeping scouts well out, and searching all dangerous ground on their exposed flank.

When halts, which are frequent, occur, or when an attack is imminent, each party should take up a position so that the whole line of the flank guard is occupied to the best advantage. When the march is resumed, but fighting is in progress, each party will rapidly move to the position vacated by the one in front; but no position should be left vacant long enough to give the enemy an opportunity of seizing it. Every line of defence must have its weak point and leave an opening for the enemy, if he can see it; it is, therefore, the object of the defence to hide this opening and to induce the enemy to attack the strong points.

I. M.I. Company as Advanced Guard in open country.



II. M.I. Company as Advanced Guard in close country.



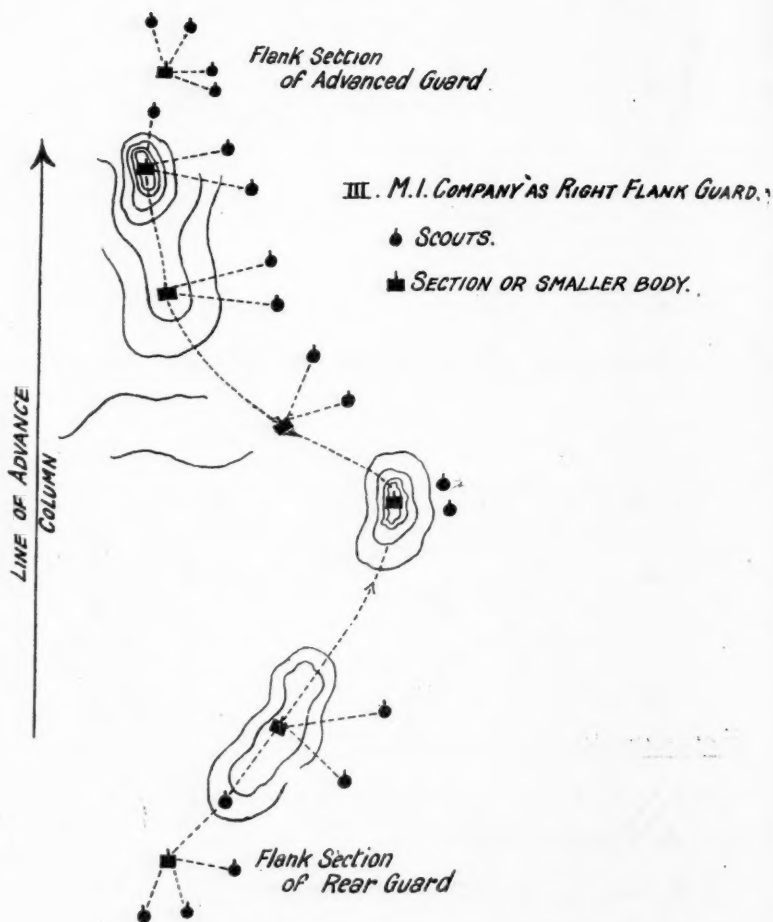
EXPLANATION:

● SCOUT

■ SECTION CLOSED

●-----● SECTION EXTENDED

Distances depend on circumstances.



ARE 12-INCH GUNS IN BATTLE-SHIPS THE BEST
VALUE FOR THE WEIGHT ENTAILED?
A PLEA FOR SHIPS DESIGNED TO SUIT
OUR STRATEGICAL NEEDS.

By FRED T. JANE, *Inventor of the Naval War Game, &c.*

Friday, 6th June, 1902.

Admiral Sir J. O. HOPKINS, G.C.B., in the Chair.

THE genesis of this paper, I should like to state at the outset, is Admiral Hopkins' desire to see discussions upon naval matters at this Institution. Within reasonable limits, I suppose, the more revolutionary the ideas put forward in such papers the better; one that provokes no hostile criticism is not likely to be of much service to anyone. In pursuance therefore of Admiral Hopkins' ideal, I am venturing to bring before your notice one or two points that have struck me rather forcibly in connection with war-ships in my position of looker-on.

I do not desire to claim the trite saying that the looker-on sees most of the game, because I do not believe in the universal truth of that saying; but—and this for a discussion subject is, I think, to the point—the looker-on does now and again see certain points that *seem* to lack due consideration by the players. They may or may not.

Of debatable points, that which strikes me as more debatable than any is the question "Do we sacrifice too much to the 12-inch gun fetish, when we reflect on our probable duties in war?"

The question, of course, has to be considered from the tactical point of view and from the strategical, and these two may possibly clash.

I will first take what I have called the "tactical" side. Now, I think it may be claimed as a postulate that our constructors in the matter of heavy guns—four guns in pairs protected from the water-line up by a solid armoured wall—are exactly where they were in the days of the "Devastation" and "Thunderer"—that is, in the early seventies, when solid shot and common shell were both regarded as projectiles to be met, and before the theorist took the bit between his teeth. "Keep out everything" was the motto in those days, and was possible till the improved gun came along, and in fulness of time it and the theorists produced the "Admiral" class. In these—as people of my profession (myself included) point out, when we want something to throw stones at, theory went mad. In a frantic determination to keep out shot from certain spots the shell was entirely forgotten. We—when so critical—forget that it was probably this patch of thick armour mania that rehabilitated the shell

and led to the introduction of the 6-inch Q.F. that might never have come had the "Dreadnought" idea been constantly preserved. The principal uses of the Q.F. seem to have been after-thoughts; they came in, surely not so much for attack of upper works and top hamper as because the thick patch of armour mania left almost the entire ship a prey to them.

Thus far, all of you will, I presume, be more or less in agreement. Now comes the debatable point. The 6-inch gun rendered the "Admirals" obsolete ere they were completed; and compound armour with a 33 per cent. saving of weight having come in, we went back to the "Dreadnought" idea and built the "Trafalgars." But in going back we did so partially only, we included the new feature of Q.F. guns, and—here the great point of departure comes in—protected those guns on a new idea. The "new idea" was to protect them with some of the saving effected by the 33 per cent. improvement in armour. I am not saying anything against that, but I mark as the debatable point, this:—

We then created an artificial axiom: that in battle the "Trafalgar's" enemy would fire his big guns at the "Trafalgar's" big gun turrets (which he could not get through) and his little guns at the "Trafalgar's" secondary guns, protected by minor armour (which also he could not then get through). Or else, if this seems too absurd, we proceeded on the argument that the secondary guns were essentially secondary, and worthy only of what could be spared for them. This idea may be right, or it may be wrong; from the "Trafalgar" to the "King Edward" our designers have never questioned it. "Protect each gun with armour able to defeat that gun"—that is the receipt upon which every ship in the world is built. The French—who, enamoured of complete belts, can afford less weight, devised a less colossal protection to 12-inch guns than we give—have embraced the idea less frantically than we have perhaps, still they have embraced it, and so has every nation. But is the idea sound? Is there any reason to suppose that Providence or the eye of man is to direct big projectiles so that they do not hit the armour of minor guns? Will 12-inch Krupp armour stop chance big shells from bursting between the big gun muzzles on a scale of chances depending on the fraction these occupy of the total area? Will 6-inch high-explosive shells respect big gun muzzles that get in their way? If a "London" fires at a "London," will not the big guns be at least as likely to be put out of action by hits from 6-inch high-explosive shells as by hits from the orthodox big gun? If this be so, we may sum up the relative merits of the 6-inch and 12-inch. The latter is protected with armour that is theoretically well-nigh impenetrable. That, at least, is the ideal. The belt, or rather the belt *plus* deck, is assumed to be the same thing. Therefore, whether the attacking gun be 6-inch or 12-inch, has it not to rely upon shell on the muzzles to disable the opposing big gun? Therefore, again, why a 12-inch shell to do what a 6-inch high-explosive shell can do? for I think it is accepted that a 6-inch high-explosive shell on a turret will do all that is necessary there. Certainly the next secondary gun, the 7.5 or 8-inch would. Of course there is the "vital blow" at near range, but that range is well inside torpedo range, and surely a torpedo is as likely to hit a ship as a big gun projectile is to secure *direct* impact upon some tiny and well-nigh invisible fraction of the enemy's area. For the *coup de grace*, is not the torpedo a substitute for the big gun?

What, then, is the 12-inch carried for? I suppose the most favourable answer is: "To keep the enemy from rendering himself shell-proof with medium armour; to compel him to expend weight in thick armour, and so to make him leave places where 12-inch shell can advantageously be placed." But a number of 6-inch shell should be equally effective in this latter case; in the former a single 12-inch gun would attain the same end—certainly a couple, as in the "Vittorio Emanuele," would. The "Vittorio Emanuele," being a ship of immense speed, is usually considered from the speed point of view only. But no weight of guns or armour has been abandoned in her for the 22 knots—that is got by sacrifices under water and by special lines. She has only two 12-inch, it is true, but on 12,000 odd tons a makeweight of a dozen 8-inch against the same number of 6-inch in our heavier "Duncan" or "London." She might, in the matter of weight, presumably have carried twenty-four 6-inch just as well as half that number of guns twice as heavy. Compared to our "Duncan" (which certainly seems a very humble effort beside her) the "Vittorio Emanuele" sacrifices two big guns and gains the equivalent of twelve 6-inch for it. Supposing half of these available on a broadside, surely six 6-inch stand a better chance of disabling an enemy than a couple of 12-inch do? And suppose she had sacrificed her other 12-inch and took a dozen more 6-inch instead—at least twenty 6-inch on the broadside—what battle-ship with the orthodox four 12-inch and six 6-inch broadside could reply to her fire?

Of course, this argument might seem susceptible of a *reductio ad infinitum* or thereabouts, and personally I must confess to a hankering after the idea that a battle-ship with all her armament carried as 3-pounders would wipe out any possible adversary, were there no question of range, magazines, etc., and were not the 6-inch the minimum shell to be relied on to detonate lyddite. That seems to fix the 6-inch as the minimum piece. I submit, therefore, to debate: Could an existing ship live as an effective unit, manœuvre and return the fire of an enemy with twenty or more armour protected 6-inch on the broadside? The question seems worth a discussion that it has never been granted.

Thus the tactical question. There is now the strategical one to refer to. Unless we are fighting three Powers—which is not so very likely, and for which we do not build—we shall have a heavy battle-ship preponderance, a heavy preponderance of 12-inch guns, each pair of which protected by several hundred tons of armour. What are we going to do with all the 12-inch?

There is a beautiful edifice called the "blue-water school," which, standing on the armchair theories of Captain Mahan, lays down that the war of the future can only be decided by the finest of battle-ships—presumably with the orthodox four 12-inch and twelve 6-inch. It is a very pretty theory; but, when we have two ships to one, what grounds are there to suppose that any Frenchman, German, or Russian is going to be ass enough to throw down the gage of battle-ship action? They—if they go to war with us—will do so with an intention to try and win, not to afford object-lessons to those who lay down laws on sea-power in the *Times*, the *Army and Navy Gazette*, or other recognised *media* for "great truths." They will want to hurt us—not to prove "great truths." They will surely take it as granted that six ships cannot fight ten in a fleet action. In theory the ten will blockade the

six; in practice—well, if the torpedo-boat did not kill the blockade long ago the submarine has, has it not? The enemy can only be "observed." Is there anything in the way of battle-ships to stop blockade running any dark night? It is taken for granted that they will run out, with an "ulterior object." What ulterior object?

It may be taken that any enemy, save the three-Power one, will pursue a *guerre de course*, simply because we are stronger, and he must do that or *nothing* with his armoured ships. Very good! Our duty is to smash him when he does. But to cook our hare we have to catch him. Whence it logically follows that speed is more essential to us than to any nation. We must have it at all costs, surely.

Our efforts in that direction are the "Canopus" class with a quarter of a knot, the "Duncans" with 1 knot over the orthodox 18, purchased in each case at the cost of armour and coal. Would it not be better in such ships to have substituted two for four 12-inch guns and to have expended the saving in more speed and Q.F. guns, especially since one 12-inch now fires about as fast as four old heavy guns? Or, if the four 12-inch be deemed essential to give back the hostile four of the same calibre, would it not be better to mount them like the 9.2's in the "Drake," and spend the balance on speed so as to ensure catching the hare to be cooked? Surely, seeing the risks run by the muzzles of the big guns from all calibres, we are unduly anxious about the far lesser risks to the *bases* of them from big armour-piercing projectiles. Whatever we do, whatever armour we pile on, we cannot give more than a 75 per cent. or 80 of certain protection to the big guns.

It is an understood thing, I believe, that a "Vittorio Emanuele" is not likely to be built for the British Navy. That is, we are not likely to reduce scantlings and so forth, to attain an identical vessel, nor apparently do we credit Colonel Cuniberti's dictum that 12,000 tons is the most economical displacement for high speed. Our receipt, or Sir William White's receipt, for speed in battle units is reduction of armour everywhere except upon the 12-inch guns. These it seems must at all cost retain exactly the mystic and orthodox 12-inch protection, and a huge castle of that.

Would we have been wrong if in the "Duncan" class we had dispensed altogether with these modern imitations of what obtained in the early sea-going monitors, if we had assumed that 100 tons of guns is (within reason) 100 tons value of it, whether in two 12-inch or seven 8-inch, nine 7.5's, or fourteen 6-inch? Suppose we had flung traditions of the "Thunderer" and "Inflexible" days to the dogs; suppose we had dispensed with the enormous 12-inch redoubts, concentrating effort instead upon a ship with the "Drake's" speed, the "Duncan's" handiness, and an armament of medium calibre numerous enough to crush the enemy with superior fire, to cover him with a cloud of bursting shells and smoke as the old "Belleisle" was covered by the 6-inch shell of the "Majestic." Would not such a ship be as well able to cook the hare as the "Duncan," and would she not be far more able to do the catching?

What use will the "King Edward VII." ever be to us? She belongs to the order of the big gooseberry; but, in market gardening (to take a homely instance) the wise man does not concentrate all efforts on a gooseberry to make his neighbours stare, but on gooseberries for *use*. Granted that the "King Edward" is an ideal floating fortress, what use is she to *us*? For France she might be excellent; the "Républicque" class may be excellent, because the nation that cannot have

numerical superiority may, perhaps be well advised to seek superiority in individual units. But we have got a numerical superiority; we shall be able, or ought to be able, to put at least five ships against every three hostile ones. Is it necessary then that each of these five shall be individually more powerful than any one of the three? Is not such a policy on a par with the old error of monster guns; imitating the days when, because the Italian "Duilio" and "Lauria" carried 100-ton guns, we built ships with guns of 110 tons—bigger gooseberries? Do not our strategical needs lie rather in speed—in ability to concentrate our numbers swiftly upon the required spot—in "Drakes" or improved "Drakes" rather than in "King Edwards"? Surely, our object is to catch every possible enemy and smash him, not merely to be able to smash him if he gives us the chance. Why should he give us the chance?

We cannot, apparently, have the ideal British strategical unit without sacrificing something. I take it as an axiom that our battle unit has to be something after the "London" style, sacrificing either guns or armament for speed. Is not the problematically valuable and, perhaps, out-of-date big gun the best thing to exchange for speed?

I submit to discussion: That our policy of battle unit construction is based upon everything save a conception of our most probable war duties; that we ignore our almost certain numerical superiority; that we are unreasonably following a fetish of the early seventies; and for years have squandered weight on four big guns without ever asking ourselves why; that, in fine, the "Duncan," "Queen," "King Edward VII.," and to a great extent the "Drake" also, all alike exhibit a failure to conceive our strategical needs. The first three represent excessive means of cooking the hare and none for catching him; the latter catching, with too limited cooking appliances. A mean will give us an individually inferior cooking apparatus maybe, but, since we have numbers on our side, does that matter? Is not the ability to catch under all conceivable circumstances worth the safer sacrifice of "big gooseberry armaments"? Is there anything outside 2,000 yards that the big guns in its hundreds of tons of mediæval castle can effect, that its weight in 6-inch guns without the castle could not effect equally well? And inside 2,000, what, in these days of gyros, is there that the torpedo cannot effect with far more certainty?

In conclusion, there is one other point that, perhaps, I ought not to neglect. Projectiles are improving, the day may come when the big gun will go through any armour at any range, and that may be cited as an argument for carrying big guns. But if that day does come, will it not make the 1,000-ton barbettes more obsolete than ever?

There are yet a few points that I might have brought forward, but the prime object of this paper is to afford matter for discussion, not to try and prove my contention to the hilt. So I will end by reiterating that since a British battle unit must sacrifice something, the monstrous barbettes are the best things to go. By way of "horrid example," I will instance the "Duncan." By giving her cruiser armour (except on the big guns) we have secured a gain of 1 knot. In other words, we have sacrificed a couple of knots or more additional speed that she might have had in order to retain the colossal 12-inch castles protecting her 12-inch guns. Does not this mean that we have clogged her strategical efficiency in worshipping a fetish of the early seventies? Is it wisdom or unreasoning adherence to a custom that has no longer any *raison d'être*?

There was no discussion.

THE TRAINING OF THE ARMY.

By Lieut.-Colonel ALSAGER POLLOCK, late Somersetshire Light Infantry.

THE Boer war has impressed upon our notice a good many things that we ought previously to have understood, but which, in spite of the oft-repeated warnings sounded by a few, the majority failed to realise. Amongst these lessons, perhaps the most important of all is that in order to be thoroughly efficient in the modern combat, the soldier must be so trained that great liberty in the exercise of individual initiative shall be combined with the most perfect discipline. Drill is quite as important in the present day as ever it was in the days of bows and arrows or the "Brown Bess," but whereas the drill of the barrack square was then also the "battle-drill," it is not so now. The close order drill of bygone days applies to modern requirements only for ceremonial purposes, and to enable the preliminary manœuvres of a battle, previously to coming under fire, to be executed without confusion, or to meet the exigencies of savage warfare. Barrack-square drill, then, which was in former times almost the be-all and end-all of military efficiency, is now merely a subsidiary means to an end, and that end is to furnish a needful preparation for modern battle-drill—more especially by inculcating the idea of coherent action. It is not enough that troops shall be expert as individual skirmishers; they must also be proficient in a proper understanding of how to concentrate their individual efforts upon the common objective. We all know that a football team, the members of which understand each other's play, and work in combination, will usually beat another perhaps individually more brilliant, but not playing properly together. The same principle applies to the fighting efficiency of a company; and the Boers themselves have proved to us by the development of their offensive powers, during the final stages of the war, that what they had previously lacked was the discipline representing the difference between a scratch team and one that employs concerted methods.

An army recruited chiefly from the large towns of a thickly populated country cannot expect to obtain raw material already possessed of the true military instinct and requiring no more than collective training in order to become fully efficient for war. The Boers, upon the contrary, had nothing to learn as individual fighters, and as soon as they had discovered, in the rough school of war itself, that prompt obedience to its commander is the only means by which any unit, large or small, can attain the full fighting value consistent with its numbers, their commandos, as such, became distinctly more formidable. Discipline amongst the Boers, especially in adverse circumstances, was far from good, even at the end; but at first it was absolutely non-existent, and hence the repeated failures to take advantage of opportunities which the incoherent, though otherwise effective, fighting of individuals had placed at their disposal.

The combatant value of the untrained European is practically nil, and his subsequent efficiency necessarily depends entirely upon the manner of his training. He will, in the modern battle be called upon to display proficiency individually and collectively, and consequently the method of training must be such that the two ideas shall go hand in hand. The individual who does as he pleases, disregarding his orders and the particular task imposed upon the unit to which he belongs, is distinctly a detrimental; and sometimes even more so than he who blindly obeys, or in default of orders does nothing.

The barrack square is generally alleged to be answerable for much lack of initiative in the British Army, and in one sense this is perfectly true; but the reason is not what is so very generally supposed. The barrack square has "stifled" no initiative whatever, for the simple reason that no initiative primarily exists in one recruit out of a hundred, and no effort has generally been made to create that which was originally deficient. The British soldier is, indeed, too much a machine, manufactured on stiff lines on the barrack square; but only because the barrack square, or its field-day counterpart, have represented practically the whole of his training. You can have a mob, but not an army, by discarding the barrack square, and so far from the latter being detrimental, it is, indeed, essential, provided that its use is properly applied, and that manœuvre and battle-training are not neglected in order to practice it. The barrack square represents the alphabet of military education, as applied to the average European recruit, and even where individual aptitude is already present, this alphabet is nevertheless an essential factor of complete efficiency. A child may learn to speak a foreign language, though it has not yet learned the alphabet of even its own. Yet, in the hereafter, such knowledge would not be sufficient to represent full scholarship in that language. Therefore the recruit, good, bad, and indifferent in point of original military instinct, must go through the mill, each to the extent found necessary for his individual case. Some are more quick than others, and the proficiency of the individual, not of the squad to which he belongs, should always be the mainspring of progress through the educational stages. This method gives rather more trouble to the instructors, but by thus giving the recruit a special inducement to take pains, the results are infinitely more satisfactory. When the writer was doing duty as major of his regimental dépôt, he personally passed every individual recruit upwards from one squad to another, both in drill and gymnastics, making the various promotions on parade under the eyes of the man's comrades. Nothing disheartens a smart recruit so much as being kept back, merely because other men in his squad are less intelligent or painstaking than himself. The regulations for the training of recruits at regimental dépôts, if obeyed to the letter, are most antagonistic to common-sense methods.

The great principle to be observed in the training of a recruit is, I think, that the "steady drill," the gymnastics, and the really combatant instruction, should proceed simultaneously; and that reliance, after a fair start has been made by advancing the education of a portion, should be placed rather upon example than upon actual teaching. Having a few fairly trained recruits as a nucleus to work upon, the fighting instruction of the remainder can best proceed by working all classes together, so that the backward learn their business by copying what the others do, or doing as the latter tell them.

Instead of the constant grind of drill, drill, drill, that is so usual, every effort should be made to vary the instruction during each parade, a little of this and then a little of that, and when the squads are "standing easy," during brief intervals, then is the time for the officer to talk to them, telling them about their fighting duties, outpost work, etc., and asking questions upon what has already been told to them. Not even the first day that the recruit appears on parade should his instruction be confined to mere barrack-square drill. For example, placed as rear-rank man to a clever lad of the "first squad," the recruit can with advantage perform his first lesson in extended order drill by signal. The meaning and object of what he is going to do should be explained during the pauses in the drill in which the man is learning the "first position of the soldier" and "standing at ease by numbers." Moreover, if an outpost drill or exercise is being performed upon the day when a recruit attends his first parade, that recruit should invariably take part in such drill or exercise. It may here be explained that outpost *drills* are used in order to teach what is done on picquet, whilst outpost *exercises* represent the practical application of the knowledge acquired at drill. In short, the drill is only drill, and can be performed on a barrack square, or even in a drill-hall, but the *exercise* involves the proper tactical disposition of the squad or company under instruction.

An obvious advantage gained by the combination of advanced instruction with the most elementary drill of the barrack square, is that from the first the recruit is thus encouraged to remember that he has brains as well as ears. The steady drill teaches that the ears must be always open, and the orders given smartly and instantly obeyed, whilst the fighting drill further teaches that what the ears hear, the brains need to understand, and that the man is regarded not as a mere automaton, but as an intelligent being, whose understanding of what is being done is a factor of importance towards solving the problem of doing it well.

From this beginning, we naturally carry on to all the recruits, by turns, commanding their squads during extended order drills, and in simple exercises, attacking, defending, skirmishing, and scouting. This may seem a rather ambitious proceeding, but in actual practice no difficulty has been found in including such experience within the twelve weeks' course of *depôt* instruction, and what has been done in one *depôt* can be done in any other, if those responsible will take the trouble to do it. The recruit in temporary command of a squad must be actually, not nominally, in command of it, and the officer or sergeant instructor in charge must never do more than correct mistakes by telling the squad leader what he has done or said wrong, and what ought to have been instead. Unless this arrangement is strictly followed there can be no sense of responsibility, and without this the rudiments of exercising command cannot be acquired. Similarly when a tactical scheme is in progress, the instructor should from time to time explain the situation to the whole squad and ask the squad leader what he proposes to do. If the answer is correct, the instructor should explain why he accepts it, or if otherwise, ask the men one by one what they think would be the proper course to adopt. For example: it being obvious that the next move in an attack is to reach some particular piece of cover or favourable fire-position; it may in one case be best to do so by crawling, man by man, along a ditch, or in another for the whole squad to rush forward simultaneously. The reasons for and

against the alternatives require to be explained to the men before either is actually employed.

Instruction in scouting can best be given by making the first lessons simply no more or less than "hide-and-seek," in which the youngsters will have healthy exercise and amusement, whilst nevertheless learning the most important elements of such work—to "see without being seen." Scouting without real men to search for is no scouting at all. There is nothing of any kind whatever that can be taught in a sham exercise that cannot be taught far better when there is no humbug, except the absence of bullets.

To impress upon men that the main objects in dealing with opposing scouts are either to capture them alive, or to avoid altogether disclosing one's own presence whilst clearly observing the enemy, a useful plan is to award "points" for performances, as follows: for having obtained the required information and returning unobserved, 3 points; for a hostile scout captured, 2 points; for a hostile scout killed, 1 point; and for any enemy missed deduct 3 points. A man touched with the hand is regarded as captured, and a man hit with a tennis ball is counted as killed.

All this may seem childish, and perhaps it is to some extent; but one is dealing with boys and it is above all things desirable to make them willing pupils—a desideratum that can only be obtained by exciting their interest in their work. Serious business can come later on: meanwhile, "philosophy in sport" should be the rule so far as a proper regard for teaching discipline will admit.

It remains now only to detail the various items of knowledge or proficiency, that should be included in the attainments of an *average* recruit after a twelve weeks' course at the *dépôt*:—

1. Reasonably smart in all squad-drill, and capable of taking his place in a company in which there is a proportion of fully-trained men.
2. Fairly smart in handling arms at manual exercise.
3. Accurate in laying an "aim" on the tripod, and capable of loading, aiming, and firing with blank cartridge, without danger to comrades.
4. Quick at using ground and cover, in order to avoid danger and use the rifle to advantage.
5. Thoroughly acquainted with the field signals, both in giving them properly and instantly understanding them.
6. Smart in extending and closing, and manœuvring in extended order by signal.
7. Acquainted with all duties in advanced, rear, and flank guards.
8. Acquainted with all duties on picquet that fall to the lot of a group leader or private soldier.
9. A fair scout, so far as regards using ground so as to "see without being seen," and with some knowledge of interpreting natural signs.
10. Acquainted with the nature of the most prominent exploits of his regiment in the past.
11. Sufficiently good at gymnastics to satisfy an inspecting officer.

The foregoing remarks are intended to apply chiefly to the infantry; but I am far from being certain that the methods suggested do not cover also the case of cavalry during the same period. Probably holding over all dealings with horses until considered fairly well trained on foot, would furnish an additional incentive to the cavalry recruit to do his best and thus gain rapidly what he would certainly regard as advancement.

The great obstacle to training at regimental depôts is the lack of suitable ground. But the barrack square, the drill field, and the public roads and footpaths will suffice for teaching all that has been here claimed as feasible. At all events, the writer found them sufficient in default of better opportunities.

Finally, it should be made worth the while of the major and other depôt officers to *work*, by letting the former clearly understand that his chances of future promotion to command a battalion will depend upon the results of his work at the depôt. Certainly the officer who cannot properly train some 70 or 80 recruits in the mere elements of their military education, must almost always be equally unfit to be entrusted with the higher training of a battalion. Everyone in the depôt needs to be made to *work*. For instance: if an exercise in night outposts has been arranged in conjunction with the local volunteers, every private soldier, except the colonel's servant, should be on parade; and as many non-commissioned officers as may be required, so long as one remains in barracks for "gate duty." It is needless to add that every officer, whether Line or Militia, should be required to attend, and no "ordinary leave" be granted upon such occasions.

The system of training the recruit at the depôt being, in my opinion, answerable to a very great extent for the future efficiency or inefficiency of the soldier, and consequently the basis of any scheme intended to effect a general improvement, I have, therefore, been compelled to repeat a certain amount of what I referred to in greater detail in an article published in this JOURNAL in May, 1902. It will, however, I hope be conceded that the wider subject is so firmly connected with the elementary one that I have a reasonable excuse for any repetitions of which I may have been guilty.

A NATIONAL GUARD.

By Lieut.-Colonel WALTER J. BOYES, Retired Pay (late Yorkshire Regiment).

AFTER three years' hard struggle we have (with assistance from our Colonies) succeeded in subduing two small rebellious States. But, though numerically small, the vastness of the area occupied, the difficult nature of the country, and other latent intricacies which had not been foreseen, such as widespread disloyalty throughout the whole of Cape Colony, have proved once again that figures cannot always be reckoned on as a true standard of faculty. Nevertheless, our inability at once to cope with and suppress the rebellion demands an exhaustive enquiry into the whole subject of our unpreparedness to meet an emergency which for years had been looming in the distance.

The fiat has gone forth, and a Royal Commission has been appointed to enquire into all the circumstances connected with the war, including, of course, the administration, organisation, distribution, and other details connected with the Army.

On looking back at the past we may well congratulate ourselves that owing to our maritime and commercial supremacy over other nations, we were able not only to effect such a stupendous undertaking as the transport of some 450,000 men, with all the *matériel* necessary for their maintenance and mobility six thousand miles from home, but also to feed, shelter, and supply the wants of some 150,000 destitute and homeless persons.

We have also reason to feel proud and grateful for the cordial and efficient support which we received in the hour of need from our Colonial possessions. But let us not forget, now that the emergency has passed, that at any time European complications may demand of us a state of readiness at short notice within our own dominion.

It is, no doubt, true that no other nation in the world could have done what we so recently have accomplished; but, on the other hand, none of the Great Powers trust for self-preservation on a mere fragmentary portion of the nation for their military strength. With them the Nation is the Army, and every man in the community is, *nolens volens*, an active unit in the scheme of national defence. But this is Conscription; and Conscription we at once denounce, without argument, as totally unsuited to our unique voluntary system of service.

The late war has, however, brought forcibly home to our minds the fact that our Army, as at present constituted, is incapable of supplying a sufficient Reserve during war on any large scale. The necessity for a Reserve, capable of mobilisation at short notice, is the problem of the day. But before going farther into this vexed question, let us consider briefly the present condition of our Army.

The Army consists of (A) the Regular Army, (B) the Auxiliary Forces.

The Regular Army is maintained primarily for the defence of our Indian and Colonial Empires; it consists of men enlisted for certain periods of service, who are fed, clothed, housed, and paid by the State for specific duties.

It is nearly equally divided between Home and Foreign Service. The strength of the Home Army is regulated chiefly by the requirements of the Foreign, the total strength of the two being about 180,000 men.

The Auxiliary Forces consist of the Militia, Yeomanry, and Volunteers. They are only partially provided for by the State, and are only partially available in extreme cases for service abroad. But we have, in addition to the above, a Reserve Force which belongs properly to the Regular Army. It consists of some 80,000 men who, having completed their required portion of service with the colours are relegated to civil life for the remaining unexpired portion of their contract. These men receive, whilst in the Reserve, a small retaining fee of 6d. a day, and are eligible for active service with the colours—if required.

This Reserve was originally intended as a Reserve proper; but as a matter of fact, whenever the men have been called out, they have been used to bring up the corps of the first line to their proper war strength. So, practically, we have no proper Army Reserve; indeed the late war has shown that the Auxiliary Forces have proved the real Reserve. This condition of things is eminently unsatisfactory; and the time has arrived when we must arrange for the maintenance of a permanent Reserve Force of considerable strength, thoroughly organised and trained, and capable of mobilisation at short notice. But how, without Conscription, are we to meet the desired end? The problem is a difficult one, but all problems have a given basis on which they must be worked, and it may be possible, by considering the question on a broader basis than that which at present exists, to suggest some scheme for starting afresh upon a wider foundation.

Human nature is, however, proverbially slow to move, and ideas which by custom have become thoroughly rooted in our system are extremely difficult to eradicate.

We have all our lives been so accustomed to look upon the Regular Army as an adequate defensive Force, maintained by the State—and for which we are taxed—that any idea as to *personal* responsibility for all alike in the matter of Home Defence is as remote from the minds of the great mass of the community as, only a few years back, would have been the idea of being able to communicate across the Atlantic without wires.

The realisation of this principle of *personal* responsibility for National Defence is the *basis*—and the *only basis* we venture to maintain—on which we may safely trust for the formation of a Reserve sufficient for all purposes.

But though this is the case, how is the conception of this truth to be brought home to the general public in a practical manner? The answer is, in the same way as any other fact or latent truth is made perceptible—that is, by means of education; but of this we will speak later on.

The Army, as before stated, is but a *fraction*—a *very small fraction*—of the nation's strength, and as a basis of supply for such a Reserve as we require is too small. If it were increased on present lines, the cost would be far too heavy a tax on our pockets. Clearly then, if we are to continue our national voluntary system of military service—of which we are so justly proud—the ground-work on which this free system is based, viz., "Patriotism" must be more widely diffused and more actively employed. We are pre-eminently a patriotic nation; but patriotism is a very widespread latent power, and, for the full development of force requires cohesion. Let us then, at the present time, when the country is exulting over the splendid manner in which this innate British quality has manifested itself during the recent war, take advantage of the opportunity to stimulate the pulse of the nation: let an effort be made to urge upon all classes, and especially upon the youths in our colleges and schools, the need which exists for giving greater scope to that quality of "grit" upon which we stake our national reputation. Let us preach a *jehad* against the manacle of Conscription—by which other nations are tied, and which is now so constantly drummed into our ears as the goal to which we must come.

As a preliminary measure towards the fulfilment of our scheme, let us agree in the first place, to transform entirely the nomenclature of military service, substituting for it a word or a title, the very name of which would (whilst embracing the Regular Army as it now stands) at once suggest the propriety of lending ourselves as patriotic subjects—not as *Conscripts*—for the safety of the Empire to which we belong and for which we are in some measure willing to hold ourselves responsible.

The title I would suggest for the attainment of this object is that of "National Guard."

The composite character of such a title would, we venture to maintain, in due course produce throughout the country (if supported by Government) a broader-minded, self-imposed moral obligation in regard to the nature and extent of our duty as true patriots. The National Guard I propose to sub-divide into separate and distinct portions:—

- (A) the Regular Army, as now constituted;
- (B) a purely Voluntary Reserve Force.

To carry out this idea in its integrity it would be necessary to combine the Militia and Volunteer Forces into one composite service, complete in itself in officers and men.

The entire organisation, training, and other details to be left entirely in the hands of the authorities belonging to the force, subject, of course, to the orders and general control of the General Officer Commanding the Army Corps in whose command it happened to be located, and under the supreme control of the Commander-in-Chief and War Office authorities.

The officers I propose to place on one general list for promotion, but irrespective of their regimental appointments (as in the Indian Army). It might be possible also to arrange, from time to time, for the transfer to the Regular Army of a certain number of officers who had qualified and who might desire to make the Army their profession.

It would, of course, be only fair to offer to men who are willing thus to lend their services for the country's cause some inducements of a substantial character not in the nature of pay, such as:—

1. Release from service on juries.
2. Free passes when travelling to attend drills or rifle practice.
3. Ammunition for rifle practice in excess of the quantity allowed for efficiency.
4. Freedom from all expenses as to uniform, equipment, etc.
5. Free admission (to men in uniform) at all Government or public places where payment is required.
6. The institution of Regimental Savings Banks with higher rate of interest (as now obtains in the Regular Army).

For the furtherance of this scheme, and in order to make it workable, not only for home defence but for active service abroad, if required, opportunity should be given to all men who are willing to enrol themselves for service abroad.

Class "B" of the National Guard would thus be formed into two parts:—

1. For Home Service.
2. For Service abroad, if required.

It may be useful here to note some of the lessons which have been forcibly brought home to our minds during the recent Boer war.

These may be summed up in a word by "good shooting" and "mobility." It must be borne in mind, with regard to good shooting, that every Boer lad is from the cradle accustomed to the use of a rifle, not only at fixed objects, but at live animals moving at unknown distances up to 1,000 yards or more.

Much is already being done to encourage rifle shooting in this country by the formation of rifle clubs and shooting galleries in many parts; but the mere fact of being able to hit a button at 50 yards, though evidence of skill in aligning sights correctly and of pulling a trigger steadily, cannot be accepted as sufficient proof of good shooting with a weapon which will carry over 2,000 yards unless the power of judging distance accurately at long range is also acquired; but skill at judging distance is no very easy matter, and can only be attained by constant practice under varying circumstances, such as in bright or cloudy weather, or in level or hilly country, etc., etc., but this in the case of lads may be left to maturer years.

A knowledge regarding the laws of trajectory, and the effect of wind on a bullet's course, are also important items in the art of shooting, and should be inculcated by means of lectures, diagrams, etc.

But allowing that the faculty of rifle shooting is of first importance in war, that of "mobility," or the power of moving rapidly from place to place, must nowadays be considered as equally essential. Every Boer is able to ride in a rough and ready manner, and though it is not possible in this country to turn every rifleman into a rider, much may be done in country districts by educating lads in the rudiments of bridling, saddling, and riding, with a view to enrolment in mounted infantry, should they become soldiers.

The expediency of providing for a separate highly mobile force—as distinct from cavalry—in war, was very forcibly pointed out by the late General Sir George Chesney some thirty years ago in a lecture

given at the United Service Institution; but, beyond the formation of a few companies of mounted infantry, no steps were taken to provide this essential adjunct to our Army; and when the Boer war began we were practically without such a force. Let us hope that the experience gained in the war may not be lost sight of now, and that mounted infantry be made a distinct feature in the organisation of all Volunteer corps, etc. With these plain facts before us, it seems only reasonable that *rifle shooting, at least*, should be incorporated into our *national school system*, in connection with physical and gymnastic training—shooting galleries being attached to all schools for this purpose.

If this concession were made, there would be no difficulty in importing into school instruction some sense of *individual responsibility* in the matter of Home Defence, and it might be possible to enhance the value of this teaching by awarding special certificates of qualification to those who had reached a certain standard of efficiency in elementary shooting. If the War Office could at the same time lay down a rule that the possession of such a certificate would carry with it some small bounty on enrolment in "The National Guard," we are sanguine enough to believe that in due course a spirit of emulation would be widely felt throughout the country, and especially amongst the class whose interest we would wish to see enlisted. Bearing in mind the fact that one Division of the Regular Army costs much about the same as the whole of our Volunteer Force as at present constituted, it is not too much to say that the advantages of the scheme we propose—apart from the high tone of voluntary service—are, on financial grounds alone, worthy of consideration, and so we leave the matter in the hands of those who are capable of forming a better judgment of the question than the writer.

WHAT HAS THE BOER WAR TO TEACH US, AS REGARDS INFANTRY ATTACK ?

*A lecture delivered before the Military Society of Berlin, 5th March, 1902,
by Lieut.-Colonel von LINDENAU, of the German General Staff.*

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(Continued from January JOURNAL, page 56.)

9. SELECTION OF THE POINT OF ATTACK.

THE three examples selected, as a glance at the sketches will show, are purely frontal attacks. As such they developed themselves, and such they were from beginning to end. The days before these battles went by without the slightest attempt being made by careful reconnaissance to obtain more favourable conditions for fighting than those which were afforded by a purely frontal attack. There was no endeavour made to keep distances between the troops during the advance, so that they might be in a position to change about from front to flank. Nowhere was there anything of the Moltke idea, namely, not to unite forces until the decisive moment in the action had arrived, so that the concentric advance to the assault might result in the enveloping of the enemy.

The English generals have been blamed for these sins of omission in every language in the world. But I may nevertheless assert, that at least there were no sins of omission. Fully conscious, as they were, of the advantages of a flanking movement, the English leaders nevertheless determined on a frontal one, because they considered it the best means, under the particular circumstance of the time, to secure success. To surround the Boer positions was, it must be admitted, a most difficult operation, on account of the methods which the Boers employed. When unable to occupy the front sufficiently, the Boers mounted their horses and prolonged the flank. This prolongation could only be effected at the cost of their already weak and widely-extended front. The idea, then, that one would thus be able to break through the line in front by bringing force to bear at a particular point was, therefore, fundamentally correct. But its accomplishment proved a much more difficult task when opposed to modern firearms than would formerly have been the case. These new long-range weapons, with the power of being able to obtain the maximum fire effect in the shortest possible time, make it easy to concentrate the fire on a given point. The intervals, which there may be between the detachments opposing an advance against the front and flank, can be covered by their cross-fire, and the enemy's attacks can be frustrated much more quickly than

formerly. To break through the enemy's centre is undoubtedly far more difficult than it used to be.

Much greater advantages can be looked for by attacks on the outer flanks. In the meantime, however, when one looks at the battle-fields of Magersfontein, Colenso, and Spion Kop, only a few advantages were gained on the outer wings in these cases. At Magersfontein the left flank rested on the Modder river, and on the right was the broad, hollow-way through which the railway found its way to Kimberley. This hollow-way can easily be brought under an effective fire from the heights on the east and those to the west of the railway. Accordingly an advance by it had to be avoided. At Spion Kop both flanks were extraordinarily strongly protected. The right wing was formed by Taba Myama, the left by Kranz Kloof. The turning of Taba Myama, viâ Acton Holmes, might have been effected, and would have been a subject for British consideration. There was a discussion at Colenso, whether it would not have been better as a preliminary to the battle to seize the Hlangwane Hill on the extreme left flank of the Boer position. From this hill the whole of the enemy's position could have been enfiladed. Its possession was a good pivot for the crossing of the Tugela and the further attacks. Its capture could not have been very difficult, because it could only be held by detached forces sent from the position on the other bank of the Tugela. There were, therefore, at Colenso and at Taba Myama some advantages to be gained by a flank attack, but they were not, however, very great. The frontal attack was, therefore, considering the Boers' mode of fighting, by no means so much to be deprecated as is generally accepted. Whether the desired result might have been arrived at more quickly in another way is intentionally left out of this discussion.

10. THE COURSE OF THE FRONTAL ATTACKS.

We will now see how the British carried out this frontal attack in the three actions, beginning with

MAGERSFONTEIN.

In his advance from the Orange River to the relief of Kimberley, Lord Methuen, after severe fighting at Belmont, Enslin, and the Modder, crossed the latter river on the 28th November. The Boers, under Cronje, had retreated to the position of Magersfontein, as shown on Plate 1. This position was strengthened in the most effective manner, and was invisible from the British side; but, since the troops were in camp at the Modder River from the 28th November to the 9th December, there should have been time for an ample reconnaissance of the position, which was only 10 kilometres distant. Nothing, however, was done, and the time was wasted. Neither the advanced line of the position, nor the extreme points of the flanks were ascertained, although sufficient cavalry and a balloon section were at hand.

After a naval gun had fired on the position at long range on the 9th December, without accomplishing anything, Methuen set out on his march at two o'clock on the afternoon of the 10th December. After they had marched 3 kilometres, and had been fired on by a few Boer advanced posts, the whole of the artillery was brought into action, and the high ground shown in the sketch was shelled till dusk, the British thinking that it was the Boer position. The Boers never replied

to this fire, and kept absolutely quiet. The advance was renewed on the night of the 10th-11th December, about 12.30 a.m. In consequence of the darkness, it was decided to advance in column of double companies, those on the wings maintaining touch by means of ropes, and no deployment was to be made until break of day. Sunrise was expected early, namely, 3.25 a.m. The Highland Brigade marched straight for the projecting portion of the hilly chain, which was believed to form the Boer left wing. Following them came the Gordons, who were not included in any brigade; whilst the Brigade of Guards advanced to the right rear of the Gordons. The 9th Brigade were ordered to occupy Moss and Brown's Drift, and to take charge of the baggage and train. The advance of the Highlanders went quite smoothly at first. In fact, they got so far as the passage of the wire entanglement. Scarcely had they done so, however, and had reached a point computed to be not more than 300 metres from the advanced trenches lying at the foot of the slope, when the Boers opened a most effective fire on them, notwithstanding the darkness. They had absolute information of the British movement, to the smallest detail. Whether this had been betrayed by means of a lightning flash or in consequence of insufficient caution being observed on the line of march is hard to say. The bright rays of a lantern carried by one of the guides is also said to have been the cause of the advance being discovered so early; and it was not till they had come to within 300 metres of the Boer position as mentioned above, that the Highlanders endeavoured to deploy and extend. They were too late, and were shot down in the attempt. The Highlanders are without doubt thoroughly fine troops, and their officers were men who were resolved to die for their country, whenever they might be called upon. They did everything that brave soldiers could do under such circumstances. In spite of this their men rushed back, and it was only after a time that the officers managed to bring them to a standstill and get them to open fire. This they did at a range of about 800 metres, and kept it up for hours. The energy of the officers further succeeded in getting forward single companies some distance by rushes. But the springing up and then advancing, the noise at the commencement of firing, and the want of uniformity in the rushes appear to have only served as a signal to the Boers to concentrate their fire as far as possible on the advancing detachments. Notwithstanding the bravery of individuals—which commanded even the admiration of their opponents—the rushes had soon to be abandoned owing to the heavy losses; and the whole forward movement came to a standstill.

Soon after the Boers had opened fire, as morning appeared, Methuen ordered the artillery to take up the position shown on the map. On the Boer side only one field piece—a Maxim-Nordenfeldt—was employed in the fight. The British artillery were, therefore, able to employ nearly all their force against the enemy's infantry. They were, nevertheless, unable to beat down the fire of the latter, even although they tried to do so for over three hours. It was ascertained at a comparatively late hour that the left wing of the Boers stretched as far as the river. Against this the Brigade of Guards advanced. These deployed under cover of advanced skirmishers, who were continually reinforced, and eventually three battalions were in the firing line; the fourth—the Scots—was held in reserve. The Brigade made good way at first. On the other hand, the Highlanders, although they had been reinforced by the battalion of Gordons, still made no way. And when,

at one o'clock, the Boers, who up to this had kept their guns in reserve, opened fire against the left wing of the Highlanders, and advanced against it with various groups, the Highlanders again retreated, taking the Gordons with them, only one portion of them holding on in front of the batteries. The British artillery endeavoured to re-establish itself by means of a change of position to the right, in front of the Guards' Brigade. They advanced with their howitzers to within 2,500, and with their other batteries to within 1,100 metres of the Boer lines, and, in concert with the Guards' Brigade, remained in action till dark. As the Boers kept persistently prolonging their left wing, and with several groups advanced to the attack in the direction of Brown's Drift, the Guards' Brigade and about half the Yorkshires were pushed forward on the extreme right flank. At the end of the fight the Scots, nearly the whole of the 9th Brigade, and the mounted infantry were still completely intact. Out of 13 battalions only eight and a half had taken part in the fight; but, notwithstanding this, Methuen, who had the reputation amongst us Germans of being an intrepid and excellent officer, gave up the fight and retired.

"BULLER'S FORTUNE AT COLENZO WAS LITTLE DIFFERENT."

In order to relieve Ladysmith, Buller had to force the passage of the Tugela. The Boers, under Botha, fully cognisant of the British advance from Frere, withdrew their advanced troops to the north side of the Tugela, and occupied and strengthened the position shown on Plate 2, which naturally was one of extraordinary strength. The railway bridge was destroyed. On the 12th December and following days the whole of the British troops intended for the attack were massed at Chieveley camp, in full view of the Boers. On the 13th and 14th as much of the Boer position as could be seen was shelled continuously by eight naval guns, under General Buller's orders. The position of the naval guns is shown in the sketch. The Boers neither replied to the fire nor occupied the positions. Behind the cover of the heights they remained quietly in their camps, with the exception of a few men on the look-out. This plan misled some of the English generals, by causing them to think that the Boers had abandoned all intention of an obstinate resistance. General Clery meanwhile issued an order, approved by General Buller, which follows *verbatim*. Although from the arrangement of this order the German system of drawing up orders is recognisable, nevertheless the majority of German officers will be of opinion that it was much too long-winded. It goes too much into detail. Its purpose was to secure the crossing of the Tugela, but in its third paragraph a movement was ordered which could only take place after the passage of the river had been secured. Further, the order brought about a far too great scattering of the troops, so that later on, at places where they should have been otherwise easily able to outnumber the enemy, the latter were able to meet them on equal terms. The order runs as follows:—

"Chieveley, December 14th, 1899.

10 p.m.

1.—The enemy is entrenched in the kopjes north of Colenso Bridge. One large camp is reported to be near the Ladysmith Road, about five miles north-west of Colenso. Another large camp is reported in

the hills which lie north of the Tugela, in a northerly direction from Hlangwane Hill, a rocky height covered with bush.

2.—It is the intention of the General Officer commanding to force the passage of the Tugela to-morrow.

3.—The 5th Brigade will move from its present camping ground at 4.30 a.m., and march towards the Bridle Drift immediately west of the junction of Doornkop Spruit and the Tugela. The Brigade will cross at this point, and, after crossing, move along the left bank of the river towards the kopjes north of the iron bridge.

4.—The 2nd Brigade will move from its present camping ground at 4 a.m., and, passing south of the present camping ground of No. 1 and No. 2 Divisional Troops (Artillery), will march in the direction of the iron bridge at Colenso. The Brigade will cross at this point, and gain possession of the kopjes north of the iron bridge.

5.—The 4th Brigade will advance at 4.30 a.m. to a point between Bridle Drift and the railway, so that it can support either the 5th or the 2nd Brigade.

6.—The 6th Brigade (less a half battalion escort to baggage) will move, at 4 a.m., east of the railway, in the direction of Hlangwane Hill, to a position where it can protect the right flank of the 2nd Brigade, and, if necessary, support it or the mounted troops referred to later as moving towards Hlangwane Hill.

7.—The officer commanding Mounted Brigade will move at 4 a.m., with a force of 1,000 men and one Battery of No. 1 Brigade Division, in the direction of Hlangwane Hill; he will cover the right flank of the general movement, and will endeavour to take up a position on Hlangwane Hill, whence he will enfilade the kopjes north of the iron bridge. He will further detail detachments of 300 and 500 men to cover the right and left flanks respectively, and protect the baggage.

8.—The 2nd Brigade Division, Royal Field Artillery, will move at 4.30 a.m., following the 4th Brigade, and will take up a position whence it can enfilade the kopjes north of the iron bridge. This Brigade Division will act on any orders it receives from Major-General Hart.

The six naval guns (two 4.7-inch and four 12-pounders) now in position north of the 4th Brigade, will advance on the right of the 2nd Brigade Division, Royal Field Artillery.

No. 1 Brigade Division, Royal Field Artillery (less one battery detached with Mounted Brigade), will move, at 3.30 a.m., east of the railway, and proceed under cover of the 6th Brigade to a point from which it can prepare the crossing for the 2nd Brigade.

The six naval guns now encamped with No. 2 Divisional Troops will accompany and act with this Brigade Division.

9.—As soon as the troops mentioned in preceding paragraphs have moved to their positions, the remaining units and the baggage will be parked in deep formation, facing north, in five separate lines, in rear of to-day's artillery position, the right of each line resting on the railway, but leaving a space of 100 yards between the railway and the right flank of the line. (Here follow the orders for the baggage, ammunition columns, and supply columns.)

10.—The position of the General Officer commanding will be near the 4.7-inch guns. The Commanding Royal Engineer will send two sections 17th Company Royal Engineers with the 5th Brigade; and one section and Headquarters with the 2nd Brigade.

11.—Each infantry soldier will carry 150 rounds on his person, the ammunition now carried in the ox-wagons of regimental transport being distributed. Infantry great-coats will be carried in two ox wagons of regimental transport if Brigadiers so wish; other stores will not be placed in these wagons.

12.—The General Officer commanding 6th Brigade will have a half battalion as baggage guard.

The two naval guns now in position immediately south of Divisional Headquarter Camp will move at 5 a.m. to the position now occupied by the 4.7-inch guns.

By order,

B. HAMILTON, Colonel."

In accordance with this order the brigades intended for the first line moved off, on the 15th December, in the most careless manner—the 2nd Brigade to the crossing at Colenso, the 5th to Bridle Drift (that is to say, to two different crossings, which lay 5 kilometres apart). The 5th Brigade advanced without any scouts in front, and exactly in the formation shown in the sketch, the leading battalion in quarter-column of fours. It may be here remarked that a British battalion is usually divided into eight companies. The remaining battalions followed in quarter-column. Just as the brigade so formed had advanced to within 500 metres of the Tugela, the enemy's first shrapnel burst in their ranks. At the same moment fire was opened quite unexpectedly by numbers of infantry entrenched on the opposite bank. The brigade formed line of battalion at once, with an interval of 100 metres between battalions, and rushed forward to the Tugela. But here the Bridle Drift was not to be found (it was supposed to lie immediately to the west of the Doornkop Spruit). One portion of the front line sprang into the Tugela, hoping to reach the opposite bank by swimming, but were caught by wire entanglements laid in the river and drowned. The remaining portion of the leading battalion commenced firing. General Hart ordered the three battalions in the rear to change direction towards the east, thinking the ford lay still further eastwards (whereas, according to some, its real position was about 1 kilometre further to the west; but according to others it had disappeared altogether, owing to the Boers having dammed it up). Here they came into the bend of the river, and established themselves in that position. Seeing that further advance was impossible, they opened a heavy, though ineffective, fire on the Boer trenches. It may here also be remarked that, though the regulations ordained volley firing, individual firing only was made use of.

General Buller, who recognised the danger to the 5th Brigade in being situated at the bend of the river, ordered General Hart to withdraw it. This was soon accomplished in the case of the two rear-most battalions, but the two battalions in front, not receiving the order for retirement till long afterwards, were fighting for several hours.

Much more tactical knowledge was shown by General Hildyard in handling his brigade than was displayed by General Hart. He formed his men from the very commencement into firing lines of great strength, with supports in rear, and caused the 2nd Battalion of the East Surrey Regiment to follow as a general reserve. The brigade was, however, only three battalions strong, as the 2nd Battalion of the

West Yorkshire Regiment had been left behind in Frere to guard the lines of communication. The brigade advanced to the west of the railway against Colenso; and as it came within 800 metres of the Tugela it was met by a heavy fire, to which it replied. To the right of the 2nd Brigade, the 6th Brigade, which had been kept next behind in rear, now joined in the fight by detachments. Another portion of the 6th Brigade deployed towards Hlangwane Hill, so as to cover the attack on Colenso. This attack made good headway, in spite of serious losses. Then there took place an episode which proved fatal to the success of the action. The 14th and 66th Batteries of the First Brigade Division, commanded by Colonel Long, who, under escort of the 6th Brigade, were to have supported the attack of the 2nd Brigade, and were intended to come into action simultaneously with six naval guns, suddenly unlimbered on the right flank of the firing line engaged against Colenso. They were here only 600 metres distant from the river. The enemy at once concentrated all their fire on them, with the result that in a short time the two batteries were silenced. They lost the greater portion of the gunners, and those who were left took refuge in the nearest donga. Colonel Long himself was badly wounded. General Buller believing, in error, that in the disaster to the 14th and 66th Batteries the six naval guns were included, gave up all hope of successfully crossing the river, although the whole of his 4th and half of his 6th Brigade were intact, and out of the 16½ battalions at his disposal only 9½ had been in action.

Even if the battle at this particular moment was not in an exactly hopeful condition, still an energetic move on the part of the fresh troops would have doubtless made, in spite of the past blunders, the success of the enterprise a possibility. But victory was only to be gained by the General himself taking supreme command of the attack. To do this it would have been necessary for General Buller to remain in rear of the advance. Instead of doing this he proceeded to the front, to where the endangered guns lay, and allowed the misfortune which had befallen them to react immediately upon himself, and thus formed a pessimistic view of the outcome of the engagement.

His subsequent orders had only for their object the saving of the guns. Hildyard's brigade, which had already reached Colenso Station, received the order to advance one battalion further towards Colenso without allowing itself to become hotly engaged, and with the remaining two battalions to proceed to the help of the guns. But in spite of the great bravery shown by these two battalions, with single companies of the 6th Brigade and the 7th Battery (which was under Dundonald's orders, and had hastened to render assistance with three teams of horses), and in spite of heroic endeavours on the part of individual officers, only two guns were rescued, ten having to be left behind, to fall later into the hands of the Boers.

At 10.30 a.m. Buller ordered a general retreat, and portions of the 4th Brigade were told off to cover the same. The official account of the battle (see Official Despatches, Part I., pp. 11, 12) gives no more definite information concerning the action of the 4th Brigade. It can, however, have only been employed in the last stage of the action, for otherwise its losses would have been heavier. In the day's engagement it had none killed and only three wounded (Official Despatches, I., p. 12). The activity of the 4th Brigade was, therefore, probably only confined to covering the retreat of the mounted troops under Lord Dundonald. The 1st Dragoons were charged with the

duty of securing the left flank. Dundonald himself advanced with a thousand men and the 7th Field Battery against Hlangwane Hill, but here met with a severe fire, and soon desisted from the prospectless attack of the hill. His battery took part in the fight at Colenso with four guns. The retreat of the British on Chieveley camp took place in good order, and the Boers did not pursue. The decisive tactical stroke intended at Colenso accordingly became, owing to the premature abandonment of the issue, merely a reconnaissance in force; and it was not until 25 days later that Buller was in a position to undertake a fresh effort for the relief of Ladysmith.

(To be continued.)

APPENDIX II.

THE BRITISH FORMATION AT MAGERSFONTEIN.

11th December, 1899.

GENERAL LORD METHUEN.

**NOT
BRIGADED**

THE GORDON HIGHLANDERS

YORKSHIRE LIGHT INFANTRY

DEPT NORTHAMPTONSHIRE.

NORTH LANCASHIRE

(m) I NORTHUMBERLAND
FUSILIERS.

I ARGYLL & SUTHERLAND
HIGHLANDERS.

ROYAL HIGHLANDERS
(Black Watch)

SEA FORTH HIGHLANDERS.

hope) **HIGHLAND LIGHT
INFANTRY**

GUARD SCOTS GUARDS.

5 II COLDSTREAM GUARDS

(c) **GOLDSTREAM GUARDS.**

II GRENADIER GUARDS

1
BATT^N M.I.



THE LANCERS

HOWITZER
BATTERY RHA 75 62 18
FIELD ARTY

COMPANY OF R E
WITH
BALLOON SECTION

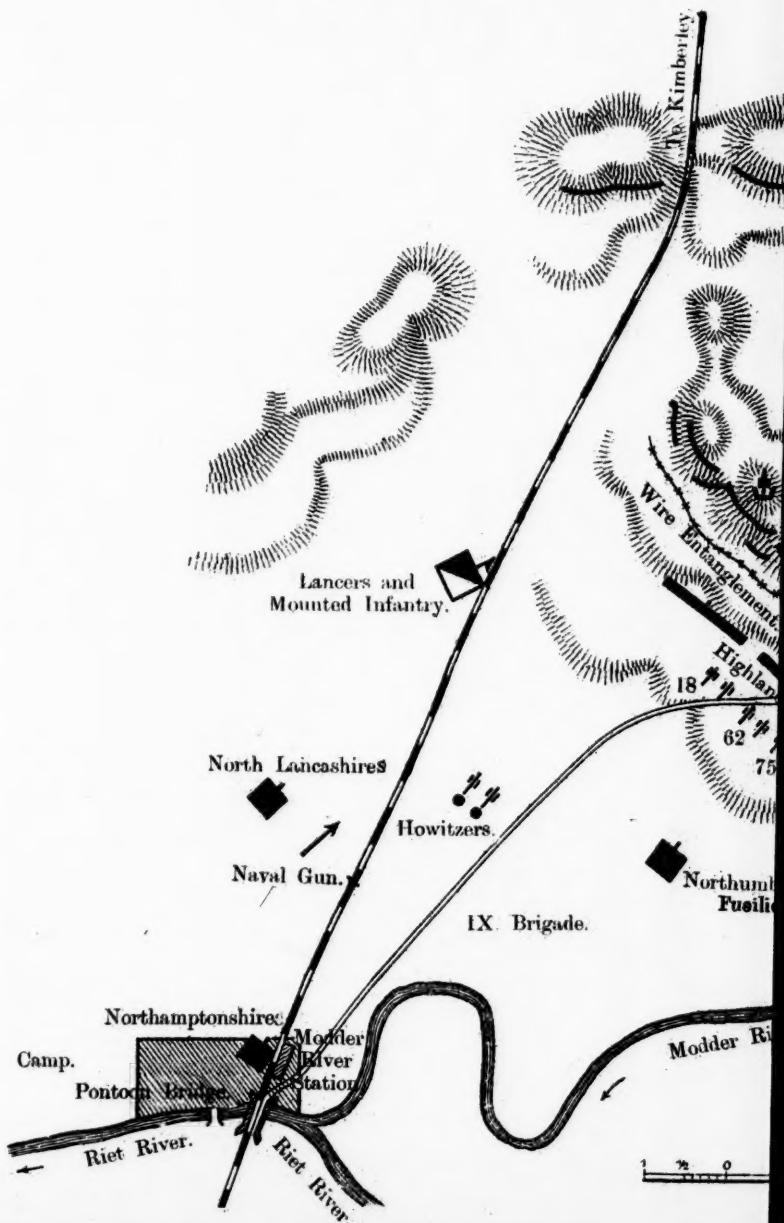
WITH
BALLOON SECTION

PLAN TO ILLUSTRATE LORD METHUEN'S OPERATIONS.



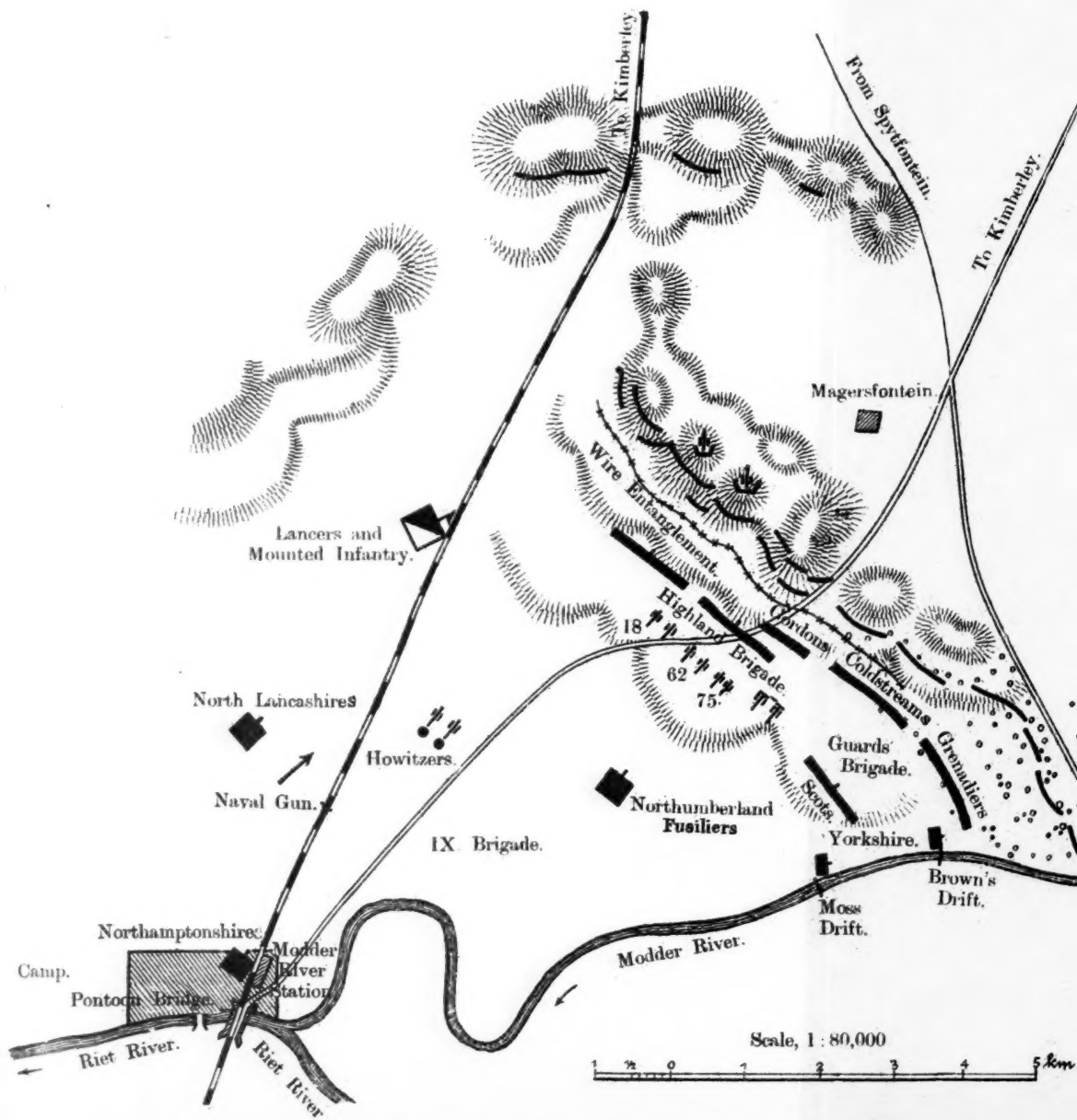
TIONS.

SKETCH TO ILLUSTRATE THE BATTLE OF
POSITION AT 1 P.M. ON THE AFTERNOON OF THE 11



SKETCH TO ILLUSTRATE THE BATTLE OF MAGERSFONTEIN.

POSITION AT 1 P.M. ON THE AFTERNOON OF THE 11TH DECEMBER, 1899.

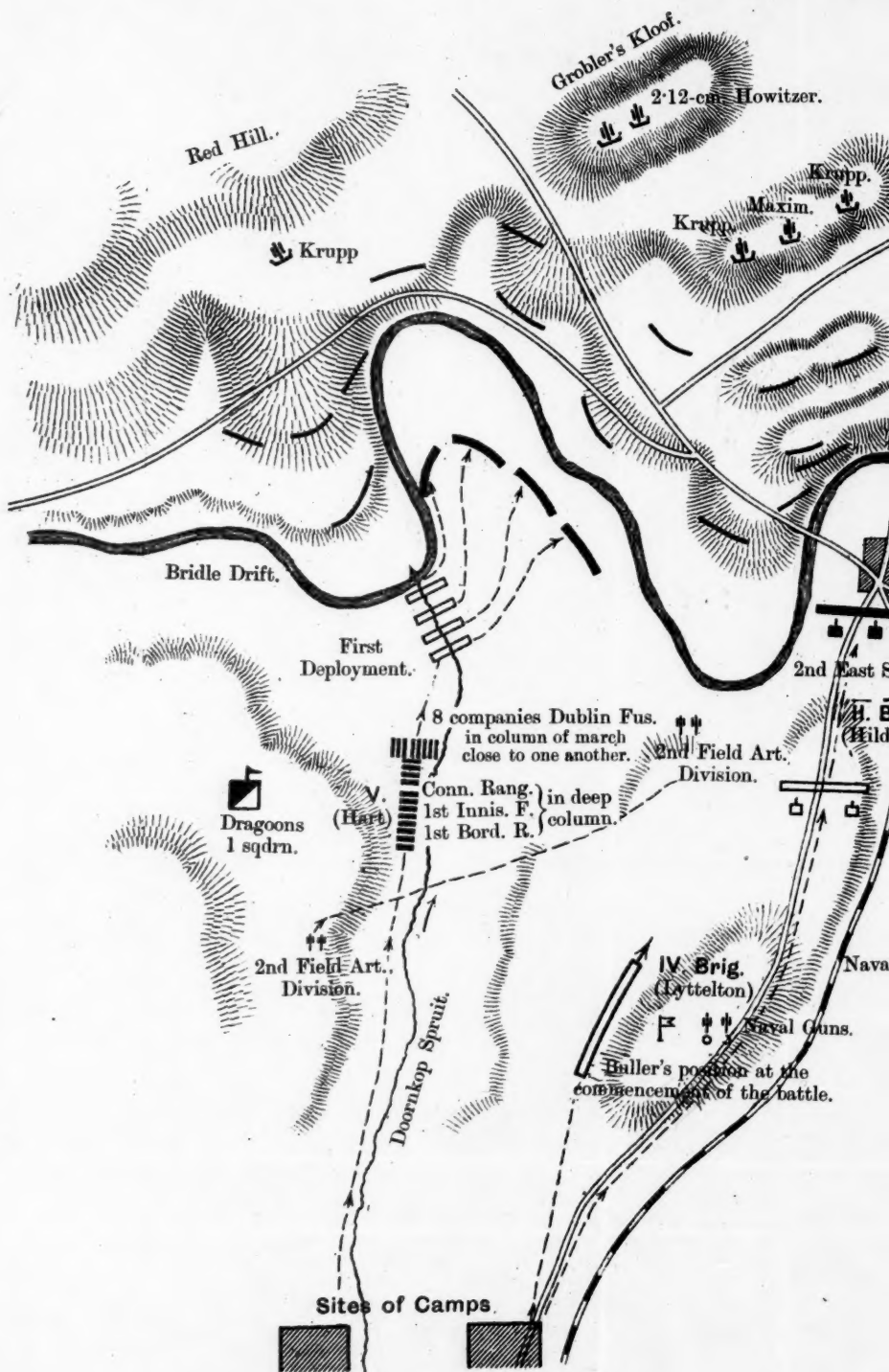




	<u>ATTACKER.</u>		<u>DEFENDER.</u>	
Leaders	LORD METHUEN.		CRONJE.	
Troops	13 Bns., 6 Sqdns 5 Batts., 1 Naval Gun.			
Strength	12,000 men. 29 guns.		6,000 men. 13 guns.	
Losses.	Officers and Men.	Per cent.	Officers and Men.	Per cent.
Total killed - - -	205		60	
„ wounded - - -	690		159	
Grand Total - - -	895	7.4	219	3.6
<i>Single battalion losses :</i>				
2nd Black Watch - - -	282	35.2		
2nd Seaforth Highlanders - - -	187	23.4		
The following percentages taken from 70-71, compare :	Battle.		Percentage of killed and wounded.	
Infantry of the Guard - - -	St. Privat.		30 (nearly)	
Rifle Battalion of Guards - - -	„		54 officers 100 p.c.	
German Infantry - - -	Mars la Tour.		25	
Infantry Regiment No. 16 - - -	„		68	
Infantry Regiment No. 52 - - -	„		52	
French 2nd Turco Regiment - - -	Wörth.		86 officers 89 p.c.	

SKETCH TO ILLUSTRATE THE BATTLE

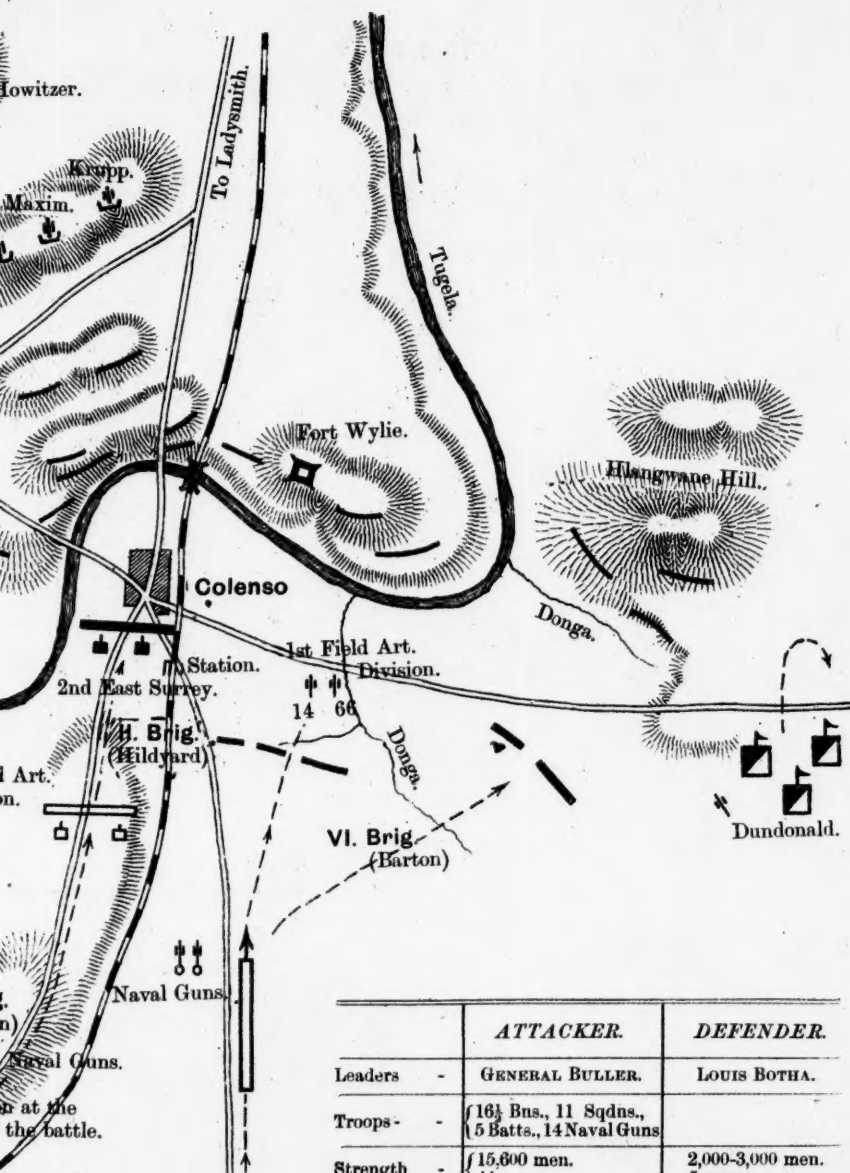
ON THE 15TH DECEMBER,



1:42 000.



THE BATTLE OF COLENZO, 5TH DECEMBER, 1899.



	ATTACKER.		DEFENDER.	
Leaders -	GENERAL BULLER.		LOUIS BOTHA.	
Troops -	{ 16½ Bns., 11 Sqdns., 5 Batts., 14 Naval Guns			
Strength -	{ 15,600 men. 44 guns.		2,000-3,000 men. 5 guns.	
Losses.	Officers & Men.	Per cent.	Officers & Men.	Per cent.
Total killed -	143		6	
" wounded -	756		25	
Grand Total -	899	5·8	31	1·5

The following suffered the greatest losses:—

2nd Bn. Royal Dublin Fus.	191	23·9		
1st Bn. Conn. Rang.	129	16·1		
1st Bn. Innis. Fus.	104	13·0		

APPENDIX III.

THE BRITISH FORMATION AT COLENZO.

15th December, 1899.

GENERAL BULLER.

2 nd BRIGADE (Hildyard)	II	ROYAL WEST SURREY		4 th DRAGOONS (ROYALS)
	II	EAST SURREY		
	II	DEVONSHIRE		
	II	WEST YORKSHIRE		
4 th BRIGADE (Lyttelton)	I	DURHAM LIGHT INFANTRY		13 th HUSSARS
	II	SCOTTISH RIFLES		
	III	KING'S ROYAL RIFLES		
	I	RIFLE BRIGADE		
5 th BRIGADE (Hart)	I	ENNISKILLING FUS.		IMPERIAL NATAL LIGHT HORSE.
	I	CONNAUGHT RANGERS.		
	II	ROYAL DUBLIN FUS. 1 st AND 2 nd BATT ^{NS} (MIXED)		
	I	BORDER REGT.		
6 th BRIGADE (Barton)	II	ROYAL SCOTS FUS.		M. I.
	I	ROYAL WELSH FUS.		
	II	ROYAL IRISH FUS.		
	II	ROYAL FUS.		

2 nd BRIG DIV. R.F.A.	1 st BRIG DIV. R.F.A.	
73	64	14 NAVAL GUNS
}		66 14 12.

17 COV R.E.

A SCHEME TO ABOLISH THE PRESENT SYSTEM OF COMPANY ACCOUNTING.

By Captain T. ORMSBY, Army Pay Department.

THE foundation of the present system of company accounting lies in the fact that the company commander is made the virtual paymaster of his men, and in this respect he is far more of a paymaster than the majority of the officers of the Army Pay Department. He is obliged to keep a ledger account for each man in his company, as well as accounts of each of the company funds, and is held personally responsible for every fraction of public money which passes through his hands for these purposes. How heavy that responsibility is, and how ill-prepared the average company officer is to face it, perhaps only those who have been closely connected with Army pay work during the last three years can fully realise.

In an article contributed by the writer last year to a Service journal, it was stated that a number of company officers had been obliged to meet deficits on their accounts, which in some cases ran into three figures. Since that statement was made, a number of fresh cases have occurred, pointing to the conclusion that there must be something radically wrong with a system which renders such a state of affairs possible. It will, of course, be argued that the fault lies entirely with the company commanders, and that they deserve no pity for having to pay the price of their own folly or carelessness; but it is not at all certain that this has always been the case, and, while it is no doubt a fact that if the company commanders would add the acquirements of an experienced paymaster to their other accomplishments, the present system might suffice, it is also equally certain that under no circumstances whatever will the present system be thoroughly satisfactory, for the following reasons:—

A thoroughly satisfactory system must be one capable of bearing without a breakdown the heaviest strain liable to be put upon it during a time of emergency. If proof is required of the failure of our present system in this respect, it is only necessary to point to the fact that at the present moment committees of adjustment are sitting at nearly every dépôt to investigate the accounts of reservists and others, which have got into a muddle during the past three years. In many, probably the majority, of these cases it has been found that the mistakes which had occurred were made, not by the units serving in South Africa, but by the provisional battalions and details at home. Now, it may be taken for granted that in any great emergency necessitating a mobilisation of the whole Army, it would be necessary to draw largely on the Reserve of Officers and on the Auxiliary Forces to supply the places of those Regular officers who would be required for duty at the front. During the past three years cases have come under my notice where newly-joined Militia subalterns who did not know, and could not be

expected to know, one end of a pay list from the other, have, owing to the exigencies of the Service, been put in financial charge of companies with most disastrous results. It therefore follows that, even if the regular company commanders were thoroughly efficient and experienced paymasters, we should, under the present system, be liable to a breakdown were a sufficient number of these officers not available. There is another point to be considered: under the present system the company accounts are kept by the pay-sergeant, and it has been a constant complaint on the part of company officers that their accountant has been suddenly taken from them at a most critical time. In some cases the pay-sergeants have been changed two or three times during a month, often without sufficient time being given to hand over the accounts properly, with the result that the pay lists have got into a mess and the company commanders let in. There are many other arguments which might be brought forward in condemnation of the present system, but the object of this paper is to formulate a scheme by which the whole of the financial responsibility at present resting on company commanders would be taken over by the Army Pay Department. The system, roughly speaking, would be similar to that adopted by large business organisations, such as railway companies, where the accounts are kept at the central offices and posted up by means of time sheets rendered periodically by the officials in charge of districts or sections. It is suggested that each unit should be taken on pay at the nearest or most convenient station pay office, the pay lists being kept and rendered monthly or quarterly by the station paymaster. In order to enable the latter to keep the accounts posted up to date, officers commanding companies would be obliged to render weekly casualty returns showing all casualties affecting the pay of their men to date. The men would receive their pay four times a month, on the 10th, 17th, 24th, and last day of the month, but they would be kept a week more in arrear than they are at present. For example: the pay due on the last day of a month would not be issued till the 10th of the following month, and the pay due on the 7th till the 14th, and so on. This would be necessary to give time for the posting up of the accounts after the weekly casualty returns had been received and to avoid overpayments. The amounts due on account of cash payments at the end of a month would be credited to the paymaster's suspense account and charged against it the following month, when the cash was actually issued. On each pay day an officer from each company would be detailed to attend at the pay office, and would receive from the station paymaster a pay sheet showing the names of the men present at the station and the amounts due to each. The officers would draw the total amounts required by their companies in cash, and after paying out, return the sheets to the paymaster with a certificate that each man had received the amount shown against his name. Men absent from the station would have their pay remitted direct, through the unit to which they were attached. The final monthly pay sheets should show the total debts and credits, and any balance carried forward, and the men could be required, if necessary, to sign their accounts, any information required regarding the charges being obtained from the duplicate casualty returns, which would be retained in the company for reference.

The next thing to consider is how to deal with the company funds, such as messing, barrack damages, library, cricket club, and so forth. As regards the first, the simplest plan would be to abolish the messing

allowance altogether, and issue a grocery ration in kind instead. This proposal was made in an article published nearly two years ago, in which I offered some suggestions for simplifying the present form of company pay list. It was pointed out therein how absurd it seemed to give a man a messing allowance with one hand and take it from him to pay for his messing with the other, when it would be so much simpler to issue the rations in kind. This, as was also suggested, might be more easily managed if the public would take over the whole management and control of the canteens, and run them through the medium of the Army Service Corps. It is surely a matter for surprise that such a lucrative business should be allowed to pass into the hands of a contractor, when it might so easily be run for the benefit of the Army. The success achieved by the Army Service Corps in managing the field canteens in South Africa ought to go a long way in support of these suggestions, but the matter is one which is outside the scope of this paper. If the messing allowance is continued, it ought to be included in the pay, and the charges for messing adjusted through the adjutant's account, in the manner laid down for regimental bills later on. Barrack damages would be dealt with by levying a general monthly charge, which would be debited to each man and credited to a station barrack damage account. At the periodical inspections of barracks the amount chargeable for damages would be assessed under two heads, namely: "Incidental Damage" and "Wilful or Excessive Damage." A distribution showing how the latter amount was recoverable would be furnished to the paymaster by officers commanding on receipt of the vouchers, all amounts so recovered would be credited to the station barrack damage account, and all charges for damages would then be met by this account. It is, no doubt, an excellent theory that charges for barrack damages should always be traceable to the individuals concerned, but in practice it is not possible to carry this out, and a fixed general charge throughout the Service would be less objectionable, and more convenient than leaving it to companies to fix their own. In the event of a barrack damage account becoming in debt or credit beyond a certain amount, it could be adjusted by levying a local general charge to meet the deficit, or distributing the surplus as a grant in aid of the company funds.

So far as the other company funds are concerned, they might be left entirely in the hands of the company officers, the latter making their own arrangements for recovering the subscriptions in cash; but if this was considered inadvisable the amounts could be recovered by the paymaster and credited to the adjutant's contingent account. The same course would be pursued with regard to regimental bills, and at the end of each month the adjutant would draw the cheques required for payment of these amounts. Rations overdrawn would be notified to the adjutant and charged to his contingent account pending recovery. Under the present system the adjutant is paid extra for work connected with the payment of the battalion, and as he would be relieved of a certain amount of this owing to the pay lists being kept in the pay office, there ought to be no objection to his work in connection with his contingent account being slightly increased.

The present form of pay and mess book, with slight alterations, might be continued in use in the station pay offices as a company day book, and the present form of company pay list, also slightly altered, would become the paymaster's company pay list and ledger account. This form would be prepared in duplicate as hitherto, one copy being

retained in the pay office, and the present company ledger accounts could be dispensed with, as a ledger account for each company would be kept in form 4 of the pay list, into which items from the general account book would be entered direct. In order to simplify accounts and reduce clerical work, it would be well if all amounts due to the soldier could be included as far as possible under the head of pay. This object will be achieved to a great extent by the scheme which comes into force in April, 1904, but even then there will be a certain number of men who will elect to remain under the existing conditions; and might not the good conduct pay granted under these conditions be charged and credited to the soldier under the head of pay instead of being made a separate item? Now it is necessary to consider how a scheme on the lines suggested would work on active service. In the first place, as regards payments, nothing in the nature of a settlement of accounts should be attempted from the time troops took the field until such time as active operations ceased, except in the case of troops and casualties returning home. If the troops are fed and clothed and generally cared for by the public while on service, why should not their pay be left to accumulate, so that each man on demobilisation would have a good round sum with which to start in civil life? This proposal will probably be considered too drastic, and there may be legal objections in the way of giving effect to it. A periodical issue of cash under the head of advances has therefore been arranged for in the following manner. Let us suppose that a portion of the Army has been mobilised and is about to proceed on active service. These troops on mobilisation would be distributed among a certain number of account dépôts, which for convenience would be numbered from one upwards, and the staff of which would be drawn from the Pay Department and Pay Corps. These dépôts ought to be included in the mobilisation scheme, so that they could be formed at once without confusion in the event of a sudden emergency. Prior to embarking, the units composing the force would be distributed among the account dépôts, and each man ought to bear about him some evidence of the dépôt to which he belonged. This might be managed by entering the number of the dépôt on the identity card sewn on the inside of the frock. Each man would also be supplied with a pay-book, with leaves and counterfoils something in the form of an ordinary cheque book, but much thinner, which could be carried in the breast pocket of his frock. The account dépôts would as a rule be kept at the base, and the accounts of the different units and individuals would be transferred direct to these dépôts from the various pay offices at home. On active service transfers between companies and units in the same dépôt would be carried out in the usual manner on receipt of the casualty return, and in the event of men being transferred to units in the payment of other dépôts, their accounts would be transferred to a separate pay list.

No transfers between account dépôts would be necessary, nor would any be permitted. There would, therefore, be no difficulty or confusion in endeavouring to discover where a man was on pay, and there would be an immense saving of clerical work. The units concerned would render periodical casualty returns to the dépôts, and the latter would keep the men's accounts posted up-to-date as far as possible. Cash offices would be opened where necessary, and officers commanding companies authorised to issue advances not exceeding a certain percentage of the pay due. Requisitions in duplicate

showing the amount to be issued to each man would be the vouchers for the cash issued, separate forms being used for each account dépôt, and in addition the amount paid to each man would be entered in his pay-book on the leaf and counterfoil; the leaves, which might be termed cash advance vouchers, would be torn out and forwarded direct to the account dépôt concerned, where the advances would be debited to the men's accounts. In the event of these vouchers being lost, the amounts would be adjusted on receipt of the duplicate requisitions and a demand for the credit from the officer in charge of the cash office. Casuals returning home would be directed to forward their pay-books to the office in which they were to be taken on pay, and pending the arrival of their accounts from abroad, would receive cash advances based on the amount of pay shown as not drawn. A fixed rule might be made that all casuals, including invalids, should, pending the transfer of their accounts, be taken on pay at their territorial dépôts. This would save the confusion which has sometimes arisen during the past emergency by men being taken on pay in two places at once. On receipt of a notification by an account dépôt of a man having embarked for home, his account would be closed and transferred home, and, in addition to showing the rates of pay and balance, the total charges and credits for the period of the account might be shown, so that the soldier would know how the balance was arrived at. The present mode of recovering allotments ought to be abolished, and something on the following lines substituted:—

On mobilisation Army Forms O 1796, should be rendered in duplicate to the paymaster charged with the issue of the allotments. The latter, after comparing the forms, would certify one as correct and pass it to the paymaster in whose payment the men were serving, whose duty it would be to see that the amounts were recovered and credited to the public monthly. In the event of a man being subsequently transferred, the amount of the allotment and the station at which issued should be shown clearly on the transfer statement of accounts, and an allotment should continue to be recovered so long as the man remained effective, till a notification was received from the paymaster concerned that he had ceased to issue it. On receipt of this communication, any amount over-recovered from the man could be adjusted. The non-recovery of an allotment for any unavoidable reason should be supported by a certificate that the casualty had been reported to the paymaster issuing the same. This plan, which I suggested some time ago, would do away with the necessity of forwarding monthly lists of allotments issued, and also with the necessity which at present exists of holding in suspense large amounts on account of allotments which have been recovered from the men, but cannot be credited to the public pending the arrival of these lists.

To work the scheme which has been proposed here successfully on active service, it would be necessary to impress on the men that their right to draw pay depended on their being able to produce their pay-books, but it may be taken for granted that in spite of all precautions a large number of books would be lost. In some cases probably, neither books nor cash advance vouchers would be forthcoming, but there ought to be comparatively few cases in which books, advance vouchers, and requisitions were all lost. In these latter cases a delay in making a final settlement would be unavoidable, but I do not think the inconvenience would be as great as that caused by taking the pay lists almost into the firing line. There are no doubt many minor

points which would require consideration, and others which would only be discovered by practical experience; but a scheme on these lines could be adopted at once, would be simple to carry out, and would involve no great change by the introduction of unfamiliar forms or methods. The system of pay-books was, I believe, tried with some of the later contingents of Imperial Yeomanry, and since writing the above I have heard that a system of cash advances, instead of a monthly settlement, is about to be tried with the British contingent serving in Somaliland.

NAVAL NOTES.

HOME.—The following are the principal appointments which have been made: Captains—H. P. Routh, M.V.O., to "Victorious"; F. F. Fegen, M.V.O., to "Mersey"; R. S. D. Cumming to "Dido"; R. S. Rolleston to "Royal Oak"; C. H. Cochran, M.V.O., to "Venus." Commanders—Hon. S. Hawke to "Bellona"; C. E. Carey to "Lion"; E. H. Grafton to "Pyramus"; J. F. Parry to "Egeria."

The third-class cruiser "Mohawk" commissioned on the 8th ult. for the Mediterranean, and left on the 17th ult. for her station, where she relieves the "Scout," a somewhat smaller vessel. The new sloop "Odin" also commissioned on the 8th ult. at Sheerness for the Cape and West Coast of Africa station, and she left for her station on the 17th ult., where she takes the place of two gun-boats, the "Thrush" and "Rattler." The new first-class armoured cruiser "Drake," a sister to the "Good Hope," commissioned on the 13th ult. at Portsmouth for service with the Cruiser Squadron: she left on the 25th ult. for Las Palmas, where she will join the flag of Rear-Admiral Fawkes, in the "Good Hope"; the second-class cruisers "Brilliant" and "Rainbow," two other vessels of the Cruiser Squadron, which have been at Gibraltar since the middle of December, left that place on the 4th inst. for Las Palmas, where they will also join the flag. At Chatham, on the 13th ult., the first-class cruiser "Hawke" was commissioned for relief duty, and she left on the 20th ult. for Malta, conveying new crews for the third-class cruiser "Pyramus," the torpedo-gunboats "Dryad" and "Speedy," and the special-service vessel "Imogene," which will be recommissioned at that port. The first-class cruiser "Andromeda," lately returned from the Mediterranean, paid off on the 10th inst. at Portsmouth. The first-class battle-ship "Royal Oak" has arrived at Portsmouth from Chatham, where she has been re-fitted and commissioned on the 12th inst. to take the place of the "Nile," in the Home Squadron, the officers and crew of the latter ship turning over to her.

The first-class belted cruiser "Galatea," which has been doing duty as coast-guard ship at Hull, paid off at Chatham on the 10th inst., her officers and men turning over to the second-class cruiser "Dido," which commissioned on the following day. The second-class cruiser "Severn," coast-guard ship at Harwich, paid off also at Chatham on the 10th, her officers and men turning over to and commissioning the "Mersey," a sister-ship, on the following day. The second-class cruisers "Minerva" and "Hyacinth" left Plymouth at 10.30 a.m., on the 4th inst., for another trial of their respective boilers; they have since arrived at Gibraltar, but no details are yet to hand as to the results of the race.

Loss of the "Orwell."—While exercising in the Corfu Channel on the night of the 30th ult., a collision occurred between the third-class cruiser

"Pioneer" and the destroyer "Orwell"; the bow of the cruiser entered the "Orwell" at the port bow light, and, cutting clean through at an angle of about 30° , came out at the other side in the middle of the stokers' mess deck. The whole of the fore part, with the bridge, conning tower, and 12-pounder gun was separated entirely from the main part of the ship, and sank almost immediately; the plates on the port side were bent round at right angles, and almost completely closed in the huge gap formed by the loss of the bow. The forward bulkhead of the boiler-room was untouched, and the ship remained afloat, although slightly down by the head, and was eventually towed back to Corfu. Unfortunately the gunner and 14 men were drowned, many of the latter having been below on the mess deck, which is in the fore part, at the time the collision occurred. It appears that six of the destroyers, of which the "Orwell" was one, were blockaded in San Giovanni Bay by the other six vessels of the flotilla, none of them showing any lights. The blockaded destroyers had to break out, eluding the enemy, and, if successful, were to discover the "Pioneer" if possible and attack her, the cruiser representing a battle-ship, making the passage between the Albanian coast and Pasco Island; to render the channel safe for her was the object of the blockade. According to the accounts received, the "Orwell" had been discovered and put out of action, and having re-hoisted her steaming lights, was about to return to the rendezvous, when the collision occurred.

Launches.—The first-class armoured cruiser "Suffolk" was launched at Portsmouth on the 15th ult., the vessel being named by Lady Stradbroke, whose husband is Vice-Admiral of the coast of that county. Her dimensions are as follows:—Length between perpendiculars, 440 feet; length over all, (about) $463\frac{1}{2}$ feet; beam, 66 feet; displacement, 9,800 tons; mean draught, $24\frac{1}{2}$ feet. She will be propelled by means of twin screws, each being actuated by an independent set of vertical triple-expansion engines, with one high, one intermediate, and two low pressure cylinders of the collective power of 11,000 horses, giving an aggregate indicated power of 22,000 horses for both sets of engines, the boiler safety valves being loaded to a pressure of 300 lbs. per square inch, the steam pressure being reduced to 250 lbs. per square inch at the engines. The steam will be supplied by 34 separate boilers of the Niclausse type. The engines and boilers are being built by Messrs. Humphrys, Tennant & Co., Deptford. The amount of coal carried at the above draught is 800 tons, but provision has been made for the stowage of about twice this amount.

The side armour is 4 inches thick, and about 11 feet deep amidships, extending in varying thicknesses right forward to the bow, and finishing well abaft the engine-room at an athwart-ships armour bulkhead. The lower deck is of the usual turtle-back shape, on which the armour rests, and is formed of two thicknesses, each of $\frac{3}{4}$ -inch steel plating. The main deck, situate at the top of the armour, is also a protective deck throughout the extent of the armour belt, and is composed of two thicknesses, each of $\frac{3}{4}$ -inch steel plating.

The "Suffolk" will be armed with fourteen 6-inch Q.F. guns, eight 12-pounder Q.F. guns, three 3-pounder Q.F. guns, two Maxims, and two 12-pounder 8-cwt. guns for boat and field purposes. Ten of the 6-inch guns will be carried in casemates, four on the upper deck, and six on the main deck, the guns in the forward casemates having a right-ahead, and those in the after casemates a right-astern fire. The casemate armour will be 4 inches in thickness. The remaining four 6-inch guns will be carried in pairs, one on the forecastle, and one on the quarter deck, on mountings each carrying two guns. These mountings will be carried in circular barbettes, protected by 4-inch armour and by shields of the same thickness.

Two submerged torpedo-tubes will be fitted forward and nine 18-inch torpedoes, besides four 14-inch torpedoes for boat service, will be carried. The ram is a steel casting weighing nearly 13 tons, and, as a protection to the ship while using the ram, the sides forward are partially covered with 2-inch armour.

The ship will be fitted with two steel masts, each 120 feet in height and carrying a search-light platform. A long-distance semaphore for signalling at sea will be fitted at the head of the mainmast. Each mast will be fitted with a derrick, to which can be attached a Temperley transporter for coaling purposes. The derrick on the mainmast is of steel, and is also used for lifting the larger boats in and out.

The boats include two steamboats, one 56 feet in length and one 40 feet in length, and nine sailing and pulling boats ranging from a 42-feet sailing launch to a 16-feet dinghy. The two steamboats are each capable of steaming about 13½ knots, and the 56 feet one will be fitted with torpedo-dropping gear.

Four sets of combined engines and dynamos will be fitted to light the ship and work the electric motors and search-lights. Every compartment will be efficiently lighted by incandescent lamps. Ventilation for spaces below the main deck will be secured by the use of electric motor fans outside the engine and boiler spaces, and by steam-driven fans in those compartments. There will be a complete installation of electric bells and voice pipes, and in addition loud-speaking telephones at important positions. An installation of wireless telegraphy will be provided. When complete, the "Suffolk" will have a complement of 687 officers and men, and will be able to accommodate, if necessary, about 90 in addition.

The new destroyer "Erne," which was launched on the 14th ult. from the yard of Palmer's Shipbuilding and Iron Company (Limited), Jarrow, is the first of the new type of torpedo-boat destroyers designed to attain a speed of 25½ knots under the usual loaded conditions. She has a length of 225 feet and a beam of 23 feet 6 inches. Her armament is the same as that of the 30-knot vessels, namely, one 12-pounder mounted on the conning-tower forward and five 6-pounders, four of these being on the broadside and one on a raised central platform aft; two 18-inch torpedo tubes are also fitted. Her complement will be about 70 officers and men. The vessel differs from the former type in having a fore-castle instead of a turtle-back deck, thus giving a much higher bow for driving against a head sea. The machinery consists of twin-screw triple-expansion engines of the builders' usual destroyer type, steam being supplied by four Reed's water-tube boilers; the total I.H.P. will be about 7,000. The structural strength of the hull has been greatly increased, involving a considerable addition to the displacement above that of the 30-knot type.

The first-class torpedo-boat No. 112, built to the order of the Admiralty, was launched on the 15th ult. from the yard of Messrs. John I. Thornycroft & Co., Limited, Chiswick. The vessel is the fourth of five sister vessels now being built by Messrs. Thornycroft of a new type, the guaranteed speed of which is 25 knots when carrying a load of 42 tons. No. 112 was launched complete, with machinery on board, and will proceed on her trials immediately.—*Times, Naval and Military Record, etc.*

Naval Expenditure and Mercantile Marine (Great Britain, etc.).—Return, showing Aggregate Naval Expenditure on Seagoing Force; Aggregate Revenue; Aggregate Tonnage of Mercantile Marine; Annual Clearances of Shipping in the Foreign Trade; Annual Clearances of Shipping in the

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Coasting Trade; Annual Value of Imports by Sea, including Bullion and Specie; and Annual Value of Exports by Sea, including Bullion and Specie, of various countries, exclusive of China and South American Republics, but including British Self-governing Colonies, for the year 1901.

NOTE.—Except where otherwise stated, the figures refer to 1901. Where it has not been possible to give the particulars for 1901, the figures for the latest year available have been shown.

Countries.	Aggregate Naval Expenditure on Seagoing Force.	Aggregate Revenue.	Aggregate Tonnage of Mercantile Marine.	Annual Clearances of Shipping in the Foreign Trade.	Annual Clearances of Shipping in the Coasting Trade.	Annual Value of Imports by Sea, including Bullion and Specie.	Annual Value of Exports by Sea, including Bullion and Specie.
BRITISH EMPIRE	£	£	Tons.	Tons.	Tons.	£	£
United Kingdom	33,302,269 (a)	142,997,999 (Year ended 31st March, 1902)	9,608,420 (b)	48,749,997 (c)	54,454,183	554,207,504	373,879,370
India	162,610 (d) (e) (1900-1901)	75,272,291 (d) (Year ended 31st March, 1901)	64,124 (f)	4,944,188 (Year ended 31st March, 1901)	12,646,595 (Year ended 31st March, 1901)	70,314,234 (d) (Year ended 31st March, 1901)	81,327,207 (d) (Year ended 31st March, 1901)
SELF-GOVERNING COLONIES (p)							
Australian Commonwealth: New South Wales... ..	—	10,805,543 (Year ended 30th June, 1901)	140,440	4,324,826	No Returns	22,904,252	22,005,488
Victoria	—	7,702,818 (Year ended 30th June, 1901)	103,922	2,944,192 (1900)	470,146 (1900)	15,538,649 (1900)	15,246,169 (1900)
South Australia (except Northern Territory)	—	2,598,307	46,085	1,997,500	No Returns	5,554,488	7,082,633
Northern Territory	—	62,642 (Year ended 30th June, 1901)	567	82,626	No Returns	106,700 (o)	148,579
Western Australia	—	3,142,912	12,113	1,872,027	No Returns	6,454,171	8,516,623
Tasmania	—	826,163	17,050	613,955 (1900)	No Returns	1,965,199	2,945,757
Queensland	—	4,096,290 (Year ended 30th June, 1901)	23,135	832,305	3,712,369 (h)	5,785,910	8,187,813
Total: Australian Commonwealth	171,958 (r)	29,355,275 (g)	343,312	12,667,431 (j)	—	58,369,369 (q)	64,132,062 (q)
New Zealand (r)	21,452 (r)	5,933,300 (Year ended 31st March, 1901)	101,863	1,075,906	7,799,897	11,817,915	12,881,424
African—							
Natal	— (s)	2,970,742 (Year ended 30th June, 1901)	2,495	1,777,902 (i)	No Returns	10,187,704 (l)	2,067,737 (k)
Cape of Good Hope	30,000 (t)	7,957,499 (Year ended 30th June, 1901)	3,093	4,896,323 (i)	4,576,170	23,992,031 (l)	10,873,273 (k)
American—							
Dominion of Canada	—	10,886,860 (Year ended 30th June, 1901)	675,627	7,028,330 (m) (Year ended 30th June 1901)	16,516,837 (m) (Year ended 30th June 1901)	39,126,478 (n) (Year ended 30th June 1901)	40,374,171 (n) (Year ended 30th June 1901)
Newfoundland	—	423,407 (Year ended 30th June, 1901)	114,553	600,725 (Year ended 30th June 1901)	No Returns	1,536,268 (Year ended 30th June 1901)	1,717,804 (Year ended 30th June 1901)

REMARKS.

(a) Of this total, £31,169,727 was ordinary expenditure, and £2,132,533 was expenditure under the Naval Works Act, 1899 (outside Navy Votes).

(b) Including the Isle of Man and Channel Islands.

(c) The tonnage of vessels employed by H.M. Government in the conveyance of troops, stores, etc., to South Africa is not included.

(d) The rupee has been converted into sterling at the rate of 1s. 4d. the rupee.

(e) Including (1) £100,000 contribution towards His Majesty's ships on the East Indian Station, and (2) £59,600 subsidy to the Admiralty for

manning and maintaining "His Majesty's ships and vessels for the Naval Defence of India," and an arrear payment of £14,600 for the year 1898-99. The balance represents expenditure on the Marine Department. The annual contributions payable by the Indian Government are (1) £100,000, and (2) £61,600.

(f) In addition to the vessels registered under the Imperial Act of 1894, India owns some vessels of small tonnage registered under the Indian Act X. of 1841; these are not included in the table.

(g) Under the Commonwealth of Australia Constitution Act, 1900, various Departments were transferred from the States to the Commonwealth during 1901, and, after deducting the Commonwealth expenses from the Revenue collected, the balance was returned to the Governments of the States. The figures given for each State, in consequence, include only the net revenue collected by the Commonwealth.

(h) Including the tonnage of vessels (2,461,830 tons) engaged in coasting voyages terminating beyond the Colony.

(i) Exclusive of the tonnage of transports.

(j) Including inter-State shipping.

(k) Including the value of gold, the produce of South African States, brought into the Colony overland, and exported by sea.

(l) Including the value of goods entered for removal to other South African States.

(m) Exclusive of the tonnage of vessels (5,766,171 tons) trading on the rivers and lakes between Canada and the United States.

(n) Total Imports and total Exports. Imports and Exports by sea are not separately shown in the Canadian returns.

(o) Including overland trade.

(p) The revenues of these Colonies are exclusive of loans raised.

(q) Including inter-State trade.

(r) During the year 1900-01 the charge of the Naval forces formerly maintained by the Governments of New South Wales, Victoria, South Australia, and Queensland, was transferred to the Australian Commonwealth. The figures furnished are for 1901-02, the first financial year during which these forces were paid for wholly by the Commonwealth. The figures given for the Australian Commonwealth and for New Zealand also include the annual contribution of £126,000 (payable in advance) towards the maintenance of His Majesty's vessels for protection of floating trade in Australasian waters. This contribution was apportioned amongst the various States of the Australian Commonwealth and New Zealand on a population basis for the year commencing 1st April, 1901, as follows:—

New South Wales	£37,549	Queensland	£13,787
Victoria	33,289	New Zealand	21,452
South Australia	10,067		
Western Australia	5,068	Total	£126,000
Tasmania	4,788		

(s) A gift of 12,000 tons of coal for the use of His Majesty's ships, etc., is made annually by the Natal Government.

(t) A sum of £30,000 is paid annually by this Colony towards the Expenditure by the Imperial Government in connection with His Majesty's Naval Service.

NOTE.—The above particulars with regard to Naval Expenditure have been furnished by the Admiralty. The remaining particulars have been extracted either from Board of Trade Returns or from the Official Returns of the various British Possessions.

Countries.	Aggregate Naval Expenditure on Seagoing Force.	Aggregate Revenue.	Aggregate Tonnage of Mercantile Marine.	Annual Clearances of Shipping in the Foreign Trade.	Annual Clearances of Shipping in the Coasting Trade.	Annual Value of Imports by Sea, including Bullion and Specie.	Annual Value of Exports by Sea, including Bullion and Specie.
	£	£	Tons.	Tons.	Tons.	£	£
Russian Empire	9,944,751 (c)	213,138,000	633,821 (1900)	8,582,312 (e)	20,005,523 (e)	33,295,000 (f) (g)	45,388,000 (f) (g)
Germany	9,624,656(d)	93,871,000	1,941,645 (1900)	14,650,766 (1900)	4,018,295 (1900)	300,811,000 (h)	241,260,000 (h)
	(Year ended 31st March, 1902)	(Year ended 31st March, 1902)				Metric Tons.	Metric Tons.
Netherlands	1,393,706	12,754,000	381,980	9,319,081	—	12,555,000 (i)	2,718,000 (i)
France	13,356,102(s)	147,026,000	1,110,988	19,329,845	7,175,321	169,999,000	142,403,000
	(Year ended 30th June, 1901)	(Year ended 30th June, 1902)				£	£
Portugal	507,430	12,405,000	109,431 (1900)	10,395,615	1,249,011 (k)	12,302,000 (f) (1900)	6,276,000 (f) (1900)
Spain	1,437,688	38,978,000	774,579 (1900)	14,302,589	11,874,156 (1900)	31,722,000 (1900)	27,967,000 (1900)
	(1902. None voted 1901)	(Year ended 30th June, 1902)					
Italy	4,666,098	73,136,000	999,918	21,371,841 (l)	9,916,096 (l)	49,239,000 (1900)	30,112,000 (1900)
	(Year ended 30th June, 1901)						
Austria-Hungary	1,812,117	<div> <div>Austria.</div> <div>66,123,000 (1900)</div> <div>Hungary.</div> <div>49,877,000 (1900)</div> </div>	<div> <div>Austria.</div> <div>192,076 (1900)</div> <div>Hungary.</div> <div>66,344 (1900)</div> </div>	<div> <div>Austria.</div> <div>2,380,531 (1900)</div> <div>Hungary.</div> <div>982,830 (1900)</div> </div>	<div> <div>Austria.</div> <div>10,290,453 (1900)</div> <div>Hungary.</div> <div>1,243,903 (1900)</div> </div>	12,945,000 (f)	12,962,000 (f)
United States	16,012,438	145,691,000	889,129 (m)	24,889,368 (n)	—	175,370,000	310,141,000
	(Year ended 30th June) (1901-2)						
Japan	3,711,526	28,135,000 (p)	863,830 (q) (1900)	4,008,567 (1899)	4,594,860 (1899)	31,818,000 (r) (1900)	27,832,000 (r) (1900)
	(Year ended 31st March, 1902)	(Year ended 31st March, 1902)					

REMARKS.

NOTE.—The *actual* Naval Expenditure for any year is seldom known—never immediately—the figures given, therefore, are the sums voted.

With regard to the revenue and commerce of foreign countries, in converting the foreign currencies into £'s sterling the par value of the foreign money has been taken.

(a) The figures relating to the tonnage of the Mercantile Marine are given in *net* tons except in the case of Portugal, Spain, and the United States.

(b) The figures relating to the clearances of shipping are given in *net* tons except in the case of Portugal and Spain.

(c) In addition to the ordinary estimates, a sum of £11,500,000 allotted in 1897 and 1898 is being spent on naval expansion.

(d) The cost of the maintenance of the forts at naval ports is included.

(e) The figures refer to Russia-in-Europe and the Caucasian ports of the Black Sea.

(f) Special Trade, *i.e.*, Imports for Home Consumption or Exports of Domestic Produce or Manufacture, as the case may be.

(g) Trade by European sea-board, including also Finland.

(h) Total Trade. Imports and Exports by Sea are not separately distinguished.

(i) The particulars as to *value* of trade by sea are not available.

(k) Portuguese vessels only.

(l) Certain vessels formerly included in the Coasting trade are now classed under the head of "Liners" and included in the Foreign Trade.

(m) Registered for over-sea (*i.e.*, Foreign Trade and Whale Fisheries).

(n) Exclusive of the tonnage of vessels (4,930,525 tons) engaged in the Lake Trade between the United States and Canada.

(p) Including the Chinese indemnity.

(q) The tonnage of Japanese vessels is the *gross tonnage* of vessels of foreign type, excluding Junks. In 1900 certain sailing vessels of half-foreign and half-Japanese type have also been included.

(r) Including Formosa.

(s) The expense of the Marine troops (viz., £1,123,675) is included, but in future this will be charged to the War Office vote.

NOTE.—The above particulars with regard to Naval Expenditure have been furnished by the Admiralty. The remaining particulars have been extracted from the Official Returns of the various Countries mentioned.

Commercial, Labour,
and Statistical Department,
Board of Trade,
November, 1902.

A. E. BATEMAN.

AUSTRIA-HUNGARY.—*Naval Estimates for 1903*.—The Ordinary Budget for the Navy for the current year amounts to 34,828,940 kronen (£1,451,205 16s.), showing an increase of 4,025,740 kronen (£167,740) over 1902; and the Extraordinary Estimates amount to 14,161,889 kronen (£590,078 7s.), showing a decrease of 1,775,740 kronen (£73,990), as compared with last year, thus making on the total Estimates for the year, an increase of 2,250,000 kronen (£93,750).

The principal items of the Ordinary Estimates are as follows:—

	Kronen.	£ s.
Pay of officers, etc.	4,184,030	= (174,334 12)
Pay of petty officers and seamen, with clothing ...	3,070,570	(127,940 8)
Land service	1,768,480	(73,686 13)
Sea "	4,364,990	(181,874 12)

Establishments:—

Hydrographical Office and Naval Library	69,720	(2,995 0)
Naval Academy	196,590	(8,191 8)
" lower-grade schools	5,370	(223 15)
" hospitals	210,230	(8,759 12)

Maintenance of the Fleet:—

Dockyards, repairs, and matériel	7,289,550	(303,731 5)
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New Ships and Machinery:—

Fifth and last Vote out of a total vote of 3,478,000 kronen (£144,916 13s.) for torpedo-cruiser "Szigetvár" (C) of 2,350 tons displacement, Ersatz "Fasana" ...	61,810	(2,575 8)
Fourth Vote out of a total vote of 11,785,050 kronen (£491,043 15s.) for ram-cruiser E of 7,300 tons displacement, Ersatz "Radetzky"	2,600,000	(108,333 4)
Third Vote out of a total vote of 17,400,000 kronen (£725,000) for battle-ship A of 10,600 tons displacement, Ersatz "Laudon"	3,800,000	(158,333 7)
Second Vote out of an approximate total vote of 17,400,000 kronen (£725,000) for battle-ship B of 10,600 tons displacement, Ersatz "Drache" ...	2,800,000	(116,666 13)
Ordnance, etc.	1,228,000	(51,166 13)
Miscellaneous expenses	3,424,600	(142,691 13)
Apparent total	35,073,940	(1,461,414 3)
Certain deductions	245,000	(10,208 7)
Real total	34,828,940	(1,451,205 16)

The following are the principal items of the Extraordinary Estimates:—
 Certain expenses in connection with Naval Academy, Kronen. £ s.
 ships' libraries, charts, etc. 25,900 = (1,036 13)

Maintenance of the Fleet—New Ships and Machinery:—

Second Vote out of a total vote of 4,500,000 kronen (£187,500) for a steel floating dock	2,200,000	(91,666 13)
Sixth and last Vote out of a total vote of 12,123,810 kronen (£505,158 15s.) for coast-defence battle-ship "Habsburg" of 8,340 tons displacement	60,000	(2,500 0)
Fifth Vote out of a total vote of 12,756,430 kronen (£531,517 18s.) for coast-defence battle-ship "Arpad," of 8,340 tons displacement	700,000	(29,166 13)
Fourth Vote out of a total vote of 12,905,000 kronen (£537,708 7s.) for coast-defence battle-ship "Babenberg," of 8,340 tons displacement	3,800,000	(158,334 0)
Second Vote out of an approximate total vote of 3,400,000 kronen (£141,666 13s.) for two Danube monitors and five patrol-boats	750,000	(31,250 0)

Ordnance—Guns, gun-mountings, ammunition, torpedoes, submarine mines, etc.:—

Fourth and last Vote for armament of coast-defence battle-ship "Habsburg"	160,000	(6,666 13)
Fourth and last Vote for armament of coast-defence battle-ship "Arpad"	565,000	(23,541 13)
Third Vote for armament of coast-defence battle-ship "Babenberg"	1,000,000	(41,666 13)
Third Vote for armament of ram-cruiser E	700,000	(29,188 13)
First Vote for armament of battle-ship A	900,000	(37,500 0)
Vote for 8-mm. machine guns and revolvers	72,000	(3,000 0)
Votes for ammunition, etc., for "Szigetvár," "Habsburg," "Arpad," "Babenberg," "E," and for 15-cm. Q.F. guns	2,130,000	(88,750 0)
Submarine mines	50,000	(2,083 7)
Torpedoes and torpedo-nets	180,000	(7,500 0)
Workshops, buildings, and other works	601,000	(25,061 13)
Expenses in connection with the Guard detachment in China	227,980	(9,499 3)
Miscellaneous	40,000	(1,666 13)
Total	14,161,880	(590,078 7)

Launch.—The new battle-ship "Babenberg" was launched on the 4th of last October from the San Marco Yard of the Stabilimento Tecnico Triestino at Trieste. She is the third ship of the "Habsburg" class to take the water. Her dimensions are as follows:—Length, 354 feet; beam, 65 feet 9 inches; displacement, 8,340 tons, with an extreme draught of 23 feet. Protection is afforded by an armour belt of chrome-nickel steel 8'8 inches thick, reaching from 4 feet 4 inches below to 3 feet 6 inches above the water-line, and extending 63 per cent of her length. Above the belt and reaching to the main or battery deck is a citadel protected by 4-inch armour, shut in by 8-inch athwartship bulkheads rising from the lower armour deck, which is 2'3 inches thick before the casemates, and 2'6 inches abaft. From the fore-end of the armour belt to the ram the side is protected by 2-inch plating. A second armour-deck 1'8 inches thick extends from the top of

the belt, while the main-deck between the fore and aft bulkheads is similarly protected, the combing of all the hatches being also armoured. There are two barbettes for the heavy guns, one forward and one aft, protected by 8·4-inch armour, with ammunition tubes 7·2 inches thick; the secondary battery of 5·9-inch Q.F. guns will be mounted in double casemates, protected by 5·4-inch armour on the outer side and 3·3 on the inner side; the fore conning-tower will be protected by 8-inch armour, decreasing to 6 inches on the communication tube; the after tower will have 4-inch armour, decreasing to 2 inches on the communication tube. All the armour will be of chrome-nickel steel hardened by a special process, and be provided by the great firm of Witkowitz & Co.

The armament will consist of three 24-centimetre (9·4-inch) 40-calibre guns, two being carried in the fore barbette and one in the after; twelve 15-centimetre (5·9-inch) 40-calibre Q.F. guns, six each side, mounted in double casemates, one over the other; ten 6-pounder and twelve 1-pounder Q.F. guns, with eight machine guns. The guns and ammunition hoists will be worked by either electricity or hand, while the ammunition tubes lead direct from the guns to the magazines, and it is calculated that by means of the electric hoists eight rounds a minute can be supplied. The axial height of the guns in the lower battery is 14 feet 8 inches above the water, in the upper battery 21 feet 4 inches, and that of the barbette guns 25 feet and 24 feet 4 inches fore and aft respectively. There will be two submerged torpedo-discharges for 18-inch Whitehead torpedoes. The heavy 24-centimetre (9·4-inch) guns are supplied by Krupp, but all the others are manufactured by the Skoda firm at Pilsen.

The ship will have twin-screws, and the engines are to develop 11,900-I.H.P., which, with 136 revolutions, is to give a speed of 18·5 knots, steam being supplied by sixteen water-tube boilers on the Belleville system. The coal stowage will be for 840 tons. Electricity will be used for lighting the ship, working the guns, barbettes, ammunition hoists, ventilators, etc., the current being supplied by six dynamos, producing three-phase currents, and under armour protection.

Steam Trial.—The new battle-ship "Habsburg," the first of the three ships of her class to be completed, passed through her steam trials successfully last September. She is fitted with twin-screws, and the engines were intended to develop 11,900-I.H.P., giving a speed of 18 knots. At the trial the results actually achieved far exceeded expectation, and were as follows:—Mean pressure at boilers, 285 lbs.; at engines, 224 lbs.; vacuum, 26 inches; I.H.P., 14,000; mean revolutions, 141·1; mean speed, for a distance of 68 knots, 19·6 knots. The engines worked well, and there were no difficulties of any kind, while the vibration was practically nil. Steam is provided by 16 Belleville boilers, with economisers, having a heating surface of 30,000 square feet, and a grate area of 864 square feet. The ship has a coal capacity of 840 tons, which, at a speed of 12 knots, gives a radius of action of 3,600 knots.

The Personnel.—According to the January "Rang-Liste," the number of active officers is as follows:—Admiral, 1; vice-admirals, 2; rear-admirals, 10; captains, 22; frigate captains, 32; corvette-captains, 39; lieutenants, first class, 147; lieutenants, second class, 76; midshipmen, 205; cadets, 172; chaplains, 9; inspector-general of hospitals, 1; deputy inspector-generals of hospitals, 3; fleet surgeons, 6; staff surgeons, 19; assistant surgeons, 30; chief engineers, 2; engineers, first class, 16; engineers, second class, 41; engineers, third class, 50; chief paymaster, 1; staff paymasters, 12; paymasters, 14; assistant-

paymasters, 127 ; clerks, 39. It is intended to raise the strength of the personnel of the fleet from 7,500 men to 10,500. This measure has been found necessary in view of the additional ships now under construction, and also owing to the larger complements which they will carry. The annual naval contingent will be raised from 1875 men to 2,625, beginning with the present year, and the full increase will be completed by 1906. The time of service in the Austro-Hungarian Navy is four years.

The Evolutionary Squadron.—The ships to form the Evolutionary Squadron for the year were commissioned on the 1st January. The squadron will consist of the new battle-ship "Habsburg," with the "Wien" and "Buda-Pest"; the torpedo-cruiser "Aspern," four destroyers, and six sea-going torpedo-boats. The squadron will be under the command of Rear-Admiral Julius von Ripper, who will hoist his flag on board the "Habsburg." The squadron will, after the conclusion of two months' preliminary training, proceed to visit the most important ports in the eastern Mediterranean, which has not been visited by a squadron for more than five years.—*Mittheilungen aus dem Gebiete des Seewesens, Marine Rundschau, and Militär-Zeitung.*

The Combined Naval and Military Manœuvres.—The manœuvres which took place in the presence of the Emperor during the first week of last September were on a more extensive scale than any which have been carried out since 1895. The scheme of the operations was the possibility of a hostile force being landed, which, in conjunction with a fleet, would threaten Pola. The main portion of the Austrian fleet was supposed to be blockaded in one of the ports of the southern portion of the Adriatic, so the attacking fleet had command of the northern portion of that sea. Moreover, Pola had to depend for defence upon its normal garrison, which, owing to other operations, could not for the time being look for any reinforcements. The naval operations were supervised by Admiral Baron von Spaun, Chief of the Admiralty, and the military by Lieut.-General Baron von Beck, Chief of the General Staff of the Army. The attacking fleet was under the command of Rear-Admiral Julius von Ripper, and was composed of the battle-ship division, consisting of the three sister ships "Monarch" (flag), "Wien," and "Buda-Pest," with a light division comprising the three small torpedo-cruisers "Tiger," "Panther," and "Leopard," under the command of Commodore Julius Ritter von Beck. The duty of the battle-ship division was to protect the disembarkation of the troops and to keep down the fire of, and if possible destroy, the coast fortifications. The troops to form the landing force were the 87th and 97th Infantry Regiments, each four battalions strong; a light battery of the 8th Division Artillery Regiment, and a squadron of the 4th Dragoon Regiment, in all 4,500 men, 110 horses, and 4 guns. The men carried 50 cartridges, except the dragoons, who had 20, while the field guns were provided with 50 rounds per gun. These were embarked in four transports, the "Habsburg," "Bukowina," "Electra," and "Galicia," all belonging to the Austrian Lloyd Company.

Acting with the land forces for the defence was a torpedo-boat flotilla, under the command of Captain Leopold von Jedina, which consisted of the torpedo-ram-cruiser "Kaiser Franz Josef I.," the destroyers "Magnit" and "Satellit," the sea-going torpedo-boats "Cobra," "Python," "Boa," and "Natter," with nine first-class and four second-class torpedo-boats. There were two naval umpires, with an assistant, attached to each of the five groups the torpedo flotilla was divided into; while for the military forces there acted as umpires two colonels from the General Staff, a lieutenant-colonel of artillery, and a corvette captain.

The manœuvres began on the 1st September by the embarkation of the troops at Trieste, which commenced at 11.30 a.m., and was completed in three hours without any hitch. The torpedo flotilla, under Captain von Jedina, put to sea at 5 p.m., steaming towards Umago—the attacking squadron, with the transports, having left about half an hour earlier. The Emperor, accompanied by the Arch-Duke Rainier, arrived at Pola at 1 p.m. on the same day, and immediately embarked on board the Imperial yacht "Miramar," which put to sea about 4 p.m., and at 9 p.m., when off Umago, fell in with the fleet standing to the southward, and took up a position at the head of the line. It was blowing fresh, with a disagreeable sea running. During the night the torpedo-boat flotilla made an unsuccessful attack upon the squadron, at the conclusion of which it took station with the rest of the fleet.

At 6 o'clock on the morning of the 2nd the squadron was off the south point of Istria. There the four transports and the torpedo-boat flotilla were detached, while the other ships of the squadron were exercised at steam tactics at full speed, and then at target practice—the targets being towed by two of the torpedo-vessels; the squadron, in two columns in quarter-line, steaming past, fire being opened at 5,000 yards; some good practice was made, the "Monarch" destroying one of the targets with the first shot from one of her 24-cm turret guns. At the conclusion of the firing the attacking and defending squadrons parted company; the first-named proceeded to rejoin the transports, which were waiting to the east of Sansego, one of the small islands of the Archipelago lying to the south-east of Istria; whilst the torpedo-boat flotilla, forming the defending force, proceeded in the direction of Pola. War was declared at 10.30 a.m. on the 2nd September. Shortly afterwards Rear-Admiral von Ripper sent his light (the 2nd) division, under the orders of Commodore von Beck, to blockade Pola. The first division itself arrived about 2 p.m. at Lussinpiccolo, in the island of the same name adjoining Sansego, the harbour of which the admiral determined to use as his base for the forthcoming operations. Here the troops were exercised firing at a target with a battery of quick-firing field guns, brought over from the mainland for the purpose. As the harbour is unfortified, booms, with wire net defences, as well as submarine mines, were laid down across the harbour's mouth—all the materials for which had been brought from Pola—while a look-out station, connected by telephone with the shore, was established on Mount Ossero, which is some 1,600 feet high.

The commander of the defending force having learnt from reports received from different quarters that the attack would be made on the east coast, which were more or less confirmed by the news that the enemy's torpedo-boats had been observed reconnoitring that coast, resolved to concentrate his troops accordingly. He had at his disposal the 5th Regiment of Landwehr Infantry, three battalions strong, with the 4th Regiment of Fortress Artillery, and a light battery for sallies (*Ausfallsbatterie*). The bulk of the torpedo flotilla—four groups—lay concealed at first in the harbour of Veruda, a small anchorage to the south of the grand harbour. The "Satellit" was ordered to cruise to the east in the Quarnero as far as Sansego and Asinello Islands, while the "Kaiser Franz Josef" remained watching the Istrian coast. It may be as well to point out that Pola lies on the south-western side of the Istrian promontory, some ten or twelve miles from its southern extremity. It is strongly fortified, both on its sea and land fronts, the line of fortifications of the latter being only from 6,000 to 10,000 yards from the eastern shore of the peninsula. It was, therefore, quite possible for a hostile squadron cruising to the east in the Quarnero to

subject the forts to a bombardment from their heavy guns, while there were several points where a landing can be effected out of range of the guns from the forts. Owing to the smallness of the defending force, but few companies could be spared for the main observation posts, which were fixed at three points—Medolino, Sissano, and Altura—between which a system of inter-communication and look-out was established. The arrangements made answered well, and when, early on the morning of the 3rd, before daylight, the enemy's troops began to land at three different points, the commander of the defending force was immediately informed of the fact.

The attacking force left the anchorage of Lussinpiccolo at 11 on the night of the 2nd, three torpedo-boats leading the line. When the squadron had passed to the north of Sansego Island they were suddenly attacked by the defending torpedo-boat flotilla, which had taken up their station under the island of Unie. The squadron seems to have been taken unawares, and it is believed would have suffered loss under the conditions of actual war. After the attack course was shaped for Medolino Gulf, and at half-past four on the morning of the 3rd they arrived off Porto Cuja, and arrangements were immediately made for landing the troops. At the same time the cruisers which had been blockading Pola rejoined the battle-ship division. In the meantime the torpedo-cruiser "Satellit," of the defending force, had reported the attacker's movements, and the "Kaiser Franz Josef," with the whole of her torpedo-boat flotilla, made another attack upon the hostile look-out ships, which, after an hour's fighting, resulted in their being driven back towards Pola. Three points were selected for the landing of the troops. Three battalions of the 87th Regiment formed the south column; the 4th Battalion of the 87th and three battalions of the 97th Regiment landing further to the north; the 4th Battalion of the 87th forming the reserve; the 1st Battalion of the 97th Regiment forming a flank guard to the north. A company of seamen, with a field gun, was also landed from each of the battle-ships. These were landed in advance of the troops, and were ordered to seize the first favourable position they could and to hold it, without allowing themselves to be enticed out by the enemy, and, as soon as the infantry came up, to join with them for the further advance. The disembarkation of the artillery and cavalry was delayed until the infantry had obtained an assured footing.

No difficulty seems to have been experienced in the disembarkation, which was covered by the fire of the battle-ships, but owing to the small capacity of the boats, several trips had to be made between the ships and shore. Nevertheless, the whole of the infantry was landed by 7 a.m. The landing of the artillery and cavalry, which began at 6.45 a.m., was more difficult owing to the want of proper transport for the horses and guns; but the last gun was on shore by 8.30 a.m., and the cavalry by 9.15 a.m.

Colonel Jobel, who commanded the defending forces, made the best dispositions he could; but the extended front of the enemy, coupled with their great superiority in force, made his position hopeless, and after a short action he was forced to draw back under cover of the forts. Whether the attacking forces could have carried any of the works by assault is a matter for conjecture. At this point the Emperor, who had personally witnessed the whole landing operations, gave the order to "Cease firing," and the exercise came to an end. In the afternoon the Emperor witnessed some Whitehead torpedo practice at a target by sea-going torpedo-boat "Condor," which was successfully carried out.

The opinion is expressed that as a result of the operations the Austro-Hungarian fleet must be strengthened, as, if an enemy has command of the sea, Pola, Trieste, and Fiume can all be seriously threatened. It is

suggested that a more central base should be established for the fleet, Lissa for preference, or some place on the coast like Trau. On the other hand, it is pointed out that landing on the Quarnero coast is impossible except in quite fine weather; and that the Istrian peninsula, being devoid of vegetation, without water, and very rocky, a hostile force would find great difficulties in investing Pola. It is further suggested that the defensive works should be extended further east, so as to cover by their fire the different points where the troops were landed during the recent operations. It appears to be the opinion, however, of competent critics, that the operations were on too small a scale for any lessons of great value to be drawn from them.—*Résumé from Beiheft 34 zur Internationalen Revue über die gesammten Armeen und Flotten.*

FRANCE.—The following are the principal promotions and appointments which have been made: Capitaines de Vaisseau—J. J. de Percin to be Rear-Admiral; P. Adigard to the "Protet" and Command of Pacific Naval Division; C. L. Duroch to "Redoutable"; De Faubornet de Montferrand to the "Lavoisier" and Command of the Newfoundland Fishery Division; F. Arago to "Gloire"; E. Farret to "Sully"; D. Bonifay to "Montcalm"; P. E. Forestier to "Infernet" and Command of the East Indian Division; J. M. Mallet to torpedo-school-ship "Magenta." Capitaines de Frégate—A. F. Coffinières de Nordeck, J. B. Degouy, J. S. Lephay, A. M. Aubin, and M. P. Hautefeuille to be Capitaines de Vaisseau; J. P. Rochas to "Nièvre"; A. Lotte to "Phlégeton"; A. Biard to "Lévrier" and Défense-Mobile of Corsica.—*Journal Officiel de la République Française.*

General.—The first-class protected cruiser "D'Entrecasteaux," flying the flag of Rear-Admiral Bayle, late second in command in China, arrived in Toulon on the 3rd inst. She left Saigon on 3rd January, and will be placed in the Second Category of the Reserve. Rear-Admiral Bayle struck his flag on the 4th inst. Rear-Admiral Le Dô, who succeeds Rear-Admiral Bayle in China as second in command, hoisted his flag at Toulon on the 28th ult., on board the first-class armoured cruiser "Montcalm," and left in his ship on the 8th inst. for his station.

During M. de Lanessan's term of office as Minister of Marine, in April last, the squadrons in the Far East and the Atlantic were re-organised.

The Pacific and Indian Ocean squadrons were united to the China command, under the Commander-in-Chief of that station, so as to form two divisions of six cruisers each, one being stationed in Chinese waters, and the other acting as a flying squadron, a reserve battle-ship division being also formed at Saigon.

In the Atlantic, the Atlantic, Iceland, and Newfoundland squadrons were united to the Northern Squadron, under the name of "Force Navale de l'Atlantique." The chief idea in these changes was to keep the ships more together for manœuvring purposes; and the advantages or disadvantages only time could prove. M. Pelletan, however, has only given it a six months' trial, and has decided to revert to the old order of things, and a decree to this effect has been issued. The reserve battle-ship division at Saigon is, however, to be maintained.

The New China Medal.—The following is a description of the new China medal, to be issued to the troops and ships which took part in the recent operations. The obverse represents the bust of a young woman, symbolising the French Republic, wearing a white colonial helmet, ornamented with a branch of oak-leaves and bearing the words "République Française." On

the reverse is shown two crossed cannon, forming, with a flag and anchor, a central device, above which is represented a Chinese pagoda, surmounted with the word "Chine," and at the sides the dates 1900 and 1901. The medal is of silver, and is suspended by a ribbon with green and yellow vertical stripes. A silver bar about the centre of the ribbon bears the inscription "1900. Chine. 1901."



Steam Trials.—The new first-class armoured cruiser "Jeanne d'Arc" made, on the 24th ult., another full-power trial, but failed to attain the 23 knots for which she was constructed. The engines developed 30,267-I.H.P., which is rather more than 1,700-H.P. in excess of the contract—which was 28,500-I.H.P.; the number of revolutions was 137, but the speed realised during a three-hours' trial was only 21·8 knots instead of 23—which is the contract. The temperature in the stokehold does not appear on this occasion to have been excessive; and the consumption of coal was 845 gr. (169 lbs.) per H.P. per hour. At the time of the trial the ship was not down to her load-draught, and the engineers and stokers were all picked men. After the trial the glands of the stuffing-box of the starboard high-pressure piston were found to be leaky, and there had been a slight heating of the bearings of this engine, while one of the pistons of the port engine was found to be cracked. The repairs will have to be made good by the Indret firm (the contractors for the engines), and will take some little time.

The new first-class cruiser "Amiral Gueydon" has been continuing her trials, and at a three hours' full-speed trial she also failed to realise the expected speed. With the engines developing 19,630–30-H.P. over the contract—the speed was only 20·3 knots, instead of the 21 knots for which she was built. On the 5th January she left to carry out a 24 hours' coal-consumption trial. At a nominal 10,000-I.H.P.—with the engines developing, however, 11,500-I.H.P.—a speed of 18 knots was reached and maintained for some hours, when it was discovered that one of the cylinder rings of the starboard engine was broken, and seven of the screws of the crown sheared. The trial consequently had to be stopped, and the

ship has since been in the dockyard hands for repairs. She is, however, now ready to recommence her trials. The necessary repairs were completed by the 28th ult., and the ship proceeded on her 24 hours' trial run, with the following results :—I.H.P., 11,000; speed, 18·8 knots; steam pressure, 16 kg. (35·26 lbs.); coal consumption per H.P. per hour, 730 gr. (1·46 lbs.)—the contract being from 750 gr. (1·5 lbs.) to 800 gr. (1·6 lbs.), which was not to be exceeded. The whole of the 28 boilers were in use; and the ventilation was satisfactory.

The trials of the new second-class battle-ship "Henri IV.," at Cherbourg, have come to an end for the time, owing to the discovery of important defects in her machinery. These will have to be remedied by the Indret firm, who constructed her engines. It is believed that the repairs and modifications which are considered necessary will not be completed for some months. The condensers are unsatisfactory; and the opportunity will be taken of changing the Rankine filters for the ordinary sponge ones.

The *Petit Var* calls attention to the failure of recent French ships to attain the speed for which they were intended. It also points out the present system of running ships at full speed for only three hours is very unsatisfactory, and it is not long enough to really test the engines and boilers. It draws unfavourable comparisons between the recent French ships and those of the English Navy—which on the whole have been uniformly successful, ships frequently exceeding the stipulated speed, although the trial is for 8 hours, and not for 3 only. It also states, with regard to the radius of action of the cruiser "Châteaurenault," that she was sent from Toulon with a full load in her bunkers of special coal, which was considered sufficient to take her as far as Singapore at an average speed of 14 knots, her nominal coal consumption at that speed being 154 lb. per H.P. per hour. She only managed, however, to reach Colombo without recoaling. Adversely criticising the French Navy, the same paper states, among other things, that the policy of building a series of big ships is due to the demands of the private shipbuilding yards, both on the part of the masters and the workmen.

Loss of a Destroyer.—The new torpedo-boat-destroyer "Espingole," during some pilotage manœuvres in the Bay of Cavalier—which abounds in sunken rocks—struck a rock, off Cape Lardier, on the 4th inst., making a hole in her side and bottom, foundering in fifteen fathoms immediately afterwards. The "Hallebarde," which was following, also grounded, but came off without harm; four other destroyers were in company; and all the crew of the "Espingole" were saved. Tugs were sent from Toulon, and, if the weather remains fine, it is hoped she may be raised. She was a Normand-built boat, of 319 tons displacement, 184 feet long, with a beam of 20 feet 9 inches, and a draught of 10 feet 9 inches. Her engines developed 5,000-I.H.P., giving a speed of 27·2 knots.—*Le Yacht, Le Temps, and Petit Var.*

UNITED STATES.—*Armoured Cruisers "Tennessee" and "Washington."*—There are probably no vessels in the United States Navy the general features or details of whose designs have been given such careful consideration as the two battle-ships and the two armoured cruisers, authorised by Act of Congress of 1st July, 1902. The designs of the two battle-ships have been completed, the contract for one, the "Louisiana," having been awarded to the Newport News Shipbuilding and Dry Dock Company, the other, the "Connecticut," is building at the New York Navy Yard. Both of the armoured cruisers, the "Tennessee" and "Washington," are to be built by contract. Speed is to be 22 knots, 1 knot in excess of the "New York"

and "Brooklyn." The "Tennessee" and "Washington" excel in battery power and protection any armoured cruiser built, building, or designed in the world, and they are the equal of a large majority of the battle-ships of the world, bearing the same relation to the battle-ship as the cavalry does to the infantry in the Army, and being able to give battle or run away from the enemy's battle-ship, as they please, and to put up a stiff fight with the finest battle-ships afloat, with a fair chance of winning out. The battery power has been greatly increased, by the substitution of four 10-inch guns in place of four 8-inch guns on the "Maryland" class, and adding two 6-inch guns to the fourteen on the "Maryland" class. The general features and dimensions of these vessels are as follows:—Length, 502 feet; beam, 72 feet 10½ inches; displacement, 14,500 tons; mean draught to bottom of keel at trial displacement, 25 feet; maximum displacement, 15,950 tons; mean draught, 27 feet; normal coal, 900 tons; bunker capacity, 2,000 tons; steaming radius at 10 knots per hour, about 6,500 knots; at full speed, about 3,100 knots; the maximum speed is not less than 22 knots, and the maximum I.H.P. (estimated) for this speed, 23,000; for hull and machinery, \$4,659,000 (£970,630) has been appropriated. The draught of these vessels is limited by the depth of the harbours of the United States. The hulls are to be of steel, with the usual cellular subdivisioning. The inner bottom has been continued from the keel to the protective deck, at each side, and extends forward and aft to about the knuckle of the keel, so that the vessels are thoroughly protected from injury in case of grounding, throughout any point in their length. The freeboard of these vessels at the line of the main deck is about 18 feet amidship, 24 feet forward, and 21 feet 6 inches aft. By reason of the high freeboard, commodious quarters are provided for all officers and men above the water-line. The conning tower, located on the lower bridge, is one deck higher than in earlier designs. The hull is protected by a 5-inch belt of armour extending from 5 feet below the normal water-line to the upper deck in wake of 6-inch guns, this armour extending to the bow and stern near the water-line to form a water-line belt, being reduced in thickness at the ends to 3 inches. Extending from the gun deck to the protective deck are bulkheads of 5-inch armour, which form the forward and after limits of the belt armour. Between the gun and berth decks are similar bulkheads, located in wake of the barbettes for the 10-inch guns, which are fitted on the gun deck, and form the forward and after limits of the side armour between the main and gun decks. Above the gun deck, in wake of the 3-inch battery, 2-inch nickel steel is fitted. The 6-inch guns on the gun deck are isolated by splinter bulkheads of 1½-inch nickel steel, extending continuously across the ship, and 2-inch nickel steel extending fore and aft.

The turrets for the 10-inch guns are protected by 9 inches of armour on the sloping face, 7 inches of armour on the sides, 5 inches in the rear, and with top plates of 2½-inch nickel steel. The barbette armour is 7 inches thick in front, reduced to a thickness of 4 inches at the back and below the gun deck, where protected by the belt and casemate armour. The protective deck, which extends from bow to stern, will be 1½ inches thick on the flat, over the engine and boiler spaces, 4 inches thick on the slopes at the side, extending down to the bottom of the belt armour, 3 inches on the slope, forward and aft. A cofferdam, 30 inches thick, will be worked from end to end of the vessel between the protective and berth decks. These cofferdams will probably be filled with water-excluding material. The secondary battery is twenty-two 3-inch rapid-fire guns, twelve 3-pounder semi-automatic guns, two 1-pounder automatic guns, two 1-pounder rapid-fire guns, two 3-inch field pieces, two machine guns of 30-calibre, and six auto-

matic guns of 30-calibre. It will be seen that this battery is more powerful than that of any similar vessel in the world. The 10-inch guns will be mounted in two elliptical, balanced turrets located within cylindrical barbettes, extending from the protective deck to well above the main deck, and turning through arcs of 270° . The 6-inch guns will be mounted, four in independent, armoured casemates on the main deck, the remainder in broadside on the gun deck, all on pedestal mounts, the back and side plates of the casemates on the main deck being of 2-inch nickel steel. At each end of the vessel four of the 6-inch guns can be trained directly ahead or directly astern, so that it is possible to obtain a direct ahead fire with the main battery of two 10-inch and four 6-inch guns, and the same number at the stern. All of the 6-inch guns can be trained through a complete angle of about 115° each. The 6-inch guns are so arranged that the muzzles are trained inside the line of side-armour, thus leaving the side clear and unobstructed while going alongside a dock or vessel, or when coaling. The 3-inch guns will be mounted as follows:—Six on sponsons on the gun deck, six in broadside on the gun deck, and ten in broadside on the main deck. The protection of these guns is as described above. Arrangements will be made for quickly and conveniently dismounting the 3-inch guns in broadside. The 3-pounders and smaller guns are mounted on the upper deck, bridges, in the tops, and wherever they can secure the most commanding positions, to be ready at all times for repelling torpedo-boat attacks and for inflicting damage upon the unprotected portion of an enemy's ship.

The ammunition and shell rooms are so arranged that about one-half the total supply of ammunition will be carried at each end of the ship. The remaining ammunition is stowed where it can readily be whipped up by hand, when time is available, from the lower to the upper platform. For handling ammunition along the central passage there will be ammunition conveyors. Provision has been made by means of power hoists to handle the 6-inch, 3-inch, and 3-pounder ammunition at the rate of seven rounds a minute. In addition to the power supply, there has been provided sufficient means for a supplementary supply of ammunition by hand, to interfere as little as possible with the power handling; so that, with the combined means of supply, it will be possible to supply ammunition to all of the guns at a rate equal to that at which they can be fired.

Wood work has been reduced to a minimum, and all such above the protective deck, except deck-planking, armour-backing, furniture, and a few minor items, will be fireproof.

Special attention has been given to the coaling of these vessels. It is the intention to hoist the coal over all, and to lower it directly through large hatches to the gun deck, where it can be handled on trucks to the various scuttles, thus avoiding the fitting of a large number of scuttles on the gun and main decks, and the fitting of portable coal chutes.

Provision has been made sufficient to carry with ease the full complement of officers and men. The boats will be handled by four electrically-operated boat-cranes. The full complement of the vessels, as flag-ships, will consist of one flag officer, one commanding officer, chief of staff, 19 wardroom officers, 12 junior officers, 10 warrant officers, 814 men. The masts will be fitted for the installation of wireless telegraphy. All spaces in officers' quarters, bounded by the outer hull, will be sheathed with asbestos or other suitable non-conducting material. All iron work exposed direct to the action of the weather on the opposite side will be cork painted. The ventilation system is to be most thorough, special attention having been given to all details of the design in this respect. By increasing the number of ventilating units, it has been possible to avoid piercing any of

the main transverse or longitudinal bulkheads below the protective deck, and to largely avoid the use of automatic valves. The engine and fireroom trunks are sheathed with asbestos to further increase the habitability of adjoining spaces. Special attention has been given to the design of all the water systems, to reduce the quantity of piping necessary, and to increase their efficiency.

The propelling engines will be of the vertical, twin-screw, four-cylinder, triple-expansion type, of a combined I.H.P. of 23,000. The steam pressure will be 250 lbs., and the stroke 4 feet. A speed of the main engines of 120 revolutions per minute is requisite to a speed of 22 knots. The diameters of the high-pressure and low-pressure cylinders will be in the ratio of 1 to 7.3. The engines will be located in two separate water-tight compartments. Steam, at a working pressure of 250 lbs., will be supplied by 16 boilers of the straight water-tube type, placed in eight water-tight compartments, having combined grate surface of at least 1,590 square feet, and heating surface of at least 68,000 square feet. Forced draught will be on the closed fireroom system. There will be four funnels on each vessel, each about 100 feet high above the keel line. Feed water will be carried in the double bottoms. The vessels are to be heated by steam throughout.

There will be a refrigerating plant of the Dense Air type, with a cooling effect equal to a daily output of three tons of ice. There will be an evaporating plant of not less than four units, having a total capacity of 25,000 gallons of potable water per day; and a distilling apparatus capable of distilling at least 10,000 gallons of water per day.

The vessels are to be provided with a laundry, capable of washing for 100 men per day; also with a bakery, and all fittings for the operation of a general messing system.—*Army and Navy Journal*.

MILITARY NOTES.

PRINCIPAL APPOINTMENTS AND PROMOTIONS FOR

JANUARY, 1903.

Brevet Colonel A. F. G. Richardson, from h.p., to be Colonel to command the 8th and 40th Regimental Districts, the King's (Liverpool Regiment), and the Prince of Wales's Volunteers (South Lancashire Regiment). Brevet Colonel H. C. Harford, from h.p., to be Colonel to command the 62nd Regimental District, the Duke of Edinburgh's (Wiltshire Regiment). Colonel Sir R. C. Hart, V.C., K.C.B., from h.p., to be a Major-General on the Staff to command the Thames District, and Commandant School of Military Engineering. Colonel J. L. C. St. Clair, C.M.G., to be Deputy Judge-Advocate. Colonel Sir A. R. F. Dorward, K.C.B., D.S.O., from Brigadier-General, China, to be a Colonel on the Staff to command the Troops, Straits Settlements, and to have the local rank of Brigadier-General whilst so employed. Colonel R. H. Murray, C.B., C.M.G., A.D.C., from h.p., to be a Colonel on the Staff to command the Troops at Alexandria, with the local rank of Brigadier-General whilst so employed.

The King has been graciously pleased to approve of the appointments of the undermentioned officers as A.D.C. to His Majesty, for the service of His Militia and Volunteer Forces respectively, viz. :—*Militia*: Lieut.-

Colonel (Colonel, retired pay) T. W., Viscount Coke, C.M.G., M.V.O., commanding the Prince of Wales's Own Norfolk Royal Garrison Artillery (Militia); Lieut.-Colonel and Hon. Colonel the Right Hon. A. H. T., Earl of Kintore, G.C.M.G., commanding 3rd Battalion the Gordon Highlanders. *Volunteers*: Lieut.-Colonel and Hon. E. J. A. Balfour (retired), lately commanding the 7th Middlesex (London Scottish) Volunteer Rifle Corps; Lieut.-Colonel and Hon. Colonel the Most Hon. Gavin, Marquis of Breadalbane, K.G., commanding the 5th (Perthshire Highland) Volunteer Battalion the Black Watch (Royal Highlanders).

Brevet Colonel C. P. Ridley, C.B., from h.p., to be Colonel to command the 63rd Regimental District (the Manchester Regiment). Major and Brevet Lieut.-Colonel A. F. Montanaro, R.A., to be Colonel in recognition of his services during the Aro Expedition in Southern Nigeria. General H. H., Viscount Kitchener of Khartoum, G.C.B., O.M., G.C.M.G., R.E., to be Commander-in-Chief in India. Major-General Sir C. E. Knox, K.C.B., to be a Major-General on the Staff to command a Division, IInd Army Corps. Major-General L. J. Oliphant, C.V.O., C.B., from Staff in South Africa, to be a Major-General on the Staff to command the 9th Brigade, 5th Division, IInd Army Corps. Brevet Colonel H. J. J. Kentish, from h.p., to be Colonel to command the 38th (the South Staffordshire Regiment) and 64th (the Prince of Wales's North Staffordshire Regiment) Regimental Districts.

BELGIUM.—*New Army Organisation.*—By a decree of the 24th November last, the King of the Belgians has approved of the new organisation of the Army on a peace footing.

In the event of a general mobilisation, the Belgian Army should be divided into a field army, troops garrisoning fortresses, and dépôt troops.

THE FIELD ARMY.

The Field Army is composed of 4 army and 2 cavalry divisions. Each army division consists of 2 infantry brigades, 1 battalion of carabiniers, 1 engineer company, 1 regiment of field artillery, 2 squadrons of cavalry, 1 field telegraph section, 2 artillery ammunition columns, 2 infantry ammunition columns, 1 supply train, 1 section engineer park, 1 ambulance column, 2 provision columns, 1 remount dépôt, and two mobile hospitals. Each cavalry division consists of 2 cavalry brigades, 2 batteries of horse artillery, 1 artillery ammunition column, the Supply personnel, and 1 ambulance column.

DEFENCE OF FORTRESSES.

Consists of a mobile defence and of garrisons for defence. The *Mobile Defence* is made up: for Liège, of 1 Regular Line regiment (the 14th), and 2 squadrons to be raised in time of war; for Namur, of 1 Regular Line regiment (the 13th), and 2 squadrons to be raised in time of war (these two regiments, the 13th and 14th, form the 9th Brigade); for Anvers, by the 5th Division. This division is composed of 2 infantry brigades (the 1st Carabinier Fortress Battalion and 4 reserve infantry regiments of 2 battalions each), 1 reserve cavalry regiment of 4 squadrons, to be raised in time of war, 6 reserve field batteries, and the various other services. The *Defence Garrisons* consist of 15 reserve infantry regiments, 5 fortress artillery regiments, 12 companies of engineers, 1 fortress telegraph company, 1 artificers' company, 1 fortress pontoon company, $\frac{1}{2}$ company of workmen, etc.

INFANTRY.

The Belgian infantry consists of 19 Regular regiments, viz. : 1 carabinier, 1 grenadier, 3 chasseur, and 14 Line regiments. These regiments are made up into 4 divisions of 4 regiments each, and 1 brigade (consisting of 2 regiments, the 13th and 14th), for the defence of Liège and Namur. The Carabinier Regiment supplies 1 Regular battalion to each of the divisions of the Army.

Hitherto all infantry regiments have consisted of 3 Regular and 2 Reserve battalions, with the exception of the Carabinier Regiment, which consisted of 4 Regular and 3 Reserve battalions. The number of Regular battalions has not been altered, but all regiments have been increased by 1 Reserve battalion. The Grenadier Regiment, as well as those of the Line and of the Foot Chasseurs, will thus have 3, and the Carabinier Regiment 4 Reserve battalions.

The regimental staff of officers consisted of : the colonel, the lieutenant-colonel, a captain as adjutant, a lieutenant or ensign, and a regimental doctor. The new organisation attaches to the staff, in addition, a second adjutant with the rank of second captain, who is not mounted. In the event of war he becomes adjutant to a reserve or fortress regiment. The battalion staff of officers consisted of the major, a second captain as adjutant, a paymaster and a doctor. The new organisation replaces the second captains by lieutenants as battalion adjutants ; those of reserve battalions have been done away with, thus allowing for first or second captains to command a reserve or fortress companies.

CAVALRY.

The cavalry retains its present organisation. It consists of 8 regiments of 5 squadrons each, viz. : 2 mounted chasseur regiments, 2 guide, and 4 lancer regiment. Each regiment has a staff, 5 active and 1 dépôt squadrons. In the event of mobilisation, the composition of the regiment is increased to 6 active squadrons and 1 dépôt squadron. Each of the 8 regiments detaches its 5th squadron to one of the four army divisions, which have thus each 2, as has already been stated. The staff and 4 squadrons are, therefore, meant to form the independent cavalry ; the 5th squadrons form the divisional cavalry, whilst the 6th squadrons, commanded by second captains, are attached to the fortress troops.

ARTILLERY.

Its organisation includes a spécial staff, 4 regiments of field and 5 of fortress artillery, and 4 special companies.

The *Field Artillery* consists of 34 Regular and 6 Reserve batteries, all with 6 guns. They are divided into field and horse artillery batteries. The field batteries, armed with 87-cm. guns, are attached to the army divisions ; the horse artillery batteries accompany the cavalry divisions and are armed with 75-cm. guns. The 1st and 3rd field artillery regiments each consist of a staff of 8 regular and 1 reserve battery, plus another reserve battery for furnishing 3 ammunition columns and a dépôt. The 2nd and 4th regiments each consist of a staff, 7 regular field, and 2 regular horse artillery batteries ; of 2 reserve field batteries, plus 1 reserve battery for providing 3 artillery ammunition columns and a dépôt.

"The Field Artillery," says the *Belgique Militaire*, "as regards organisation, remains provisionally as at present constituted. To ensure its re-organisation, which will no doubt be shortly taken in hand, the annual contingent of this branch of the Service has been increased by 240 men, who were first raised at the last enrolment. These 240 men are obtained from the reduction of the annual contingents enlisted for the transports, the administrative battalion, and the fortress artillery, as well as from men of the contingent

enrolled into the artillery pontoon company, which has been abolished. The future doubling of the field artillery, laid down by the Mixed Commission, will entail the formation of 18 regular and 6 reserve batteries, so as to have a brigade of 2 regiments of 6 batteries to an army division."

Fortress Artillery consisted of 58 regular, 8 reserve, and 5 dépôt battalions, divided into 5 regiments. These 5 regiments were formed into 3 groups, the headquarters of which were Anters, Liège, Namur, and the fort de Huy. The fortress artillery will in future be organised according to the positions to be fortified and grouped in each of these by sections and by battalions. The number of battalions attached to each section will be determined by the importance of the latter.

Up to the present the Belgian field artillery has consisted of guns of the 1878 Krupp model of two calibres—one of 2·95-inch for the horse artillery, and one of 3·42 for the foot artillery. At the beginning of 1900 a committee was formed to decide on the best type for new guns, and as a result of the committee's deliberations a battery of guns of a new type was ordered from the John Cockerill Nordenfeldt Company, at Seraing, in order that the guns might be put to the test of actual use in the Army. In these guns the barrel and carriage form, for the purpose of firing, one rigid piece; and this type of gun would probably have been selected for the Belgian artillery had not the new French gun prevented the committee from coming to a final decision. The principle of the French gun is the very opposite to the Cockerill gun, as in its case the barrel slides backwards and forwards on the carriage. The committee is now engaged in considering the respective merits of the two systems, but it is not stated whether the secret of the construction of the French gun is known to it.

Special Companies.—The artillery has hitherto included 4 special companies, viz.: 1 pontoon, 1 artificers, 1 workmen, and 1 armourers. In future there will be only 3, the pontoon company having been abolished and its functions transferred to the similar company of engineers.

ENGINEERS.

Consists of 1 regiment and 5 special companies. *The regiment* has hitherto consisted of a staff, 3 regular battalions of 4 companies, 1 reserve battalion of 4 companies, and 1 dépôt. It will, in future, consist of a staff, 6 battalions, and a dépôt. The dépôt retains its present organisation.

Special Companies have hitherto consisted of 1 railway company, 2 telegraph companies, 1 pontoon, and 1 workmen's company. They will, in future consist of 1 railway, 1 telegraph, 1 pontoon, 1 workmen and balloonist, and 1 torpedo and artificers' company. The 2 telegraph companies are thus amalgamated into a single unit. Its officers, and those of the pontoon company, are mounted in time of peace.

TRANSPORT.

The Transport Regiment retains its present organisation.

ADMINISTRATION.

No change has been introduced into the general staff, the staff corps, or the commissariat. According to the *Belgique Militaire*, the war effectives amount to about 170,000 men, 100,000 of whom belong to the field army, and the remaining 70,000 to the garrisons for the defence of fortresses.—*Revue du Cercle Militaire*.

BULGARIA.—*War Budget, 1902.*—The Sobranje has only lately voted the Budget for 1902. It amounts to 20,430,892 levas (a leva = a franc)

against 20,327,020 of the preceding year, thus showing an increase of 103,872 levas over the latter. The following table shows the different items in the present and preceding Budget, with their increase or decrease :—

Items.	1902.	1901.	Increase.	Decrease.
1. Maintenance, lodging, etc., for officers, doctors, etc. ...	8,185,960	7,995,960	190,000	—
2. Maintenance, etc., for rank and file ...	2,336,900	2,203,060	133,840	—
3. Military bakeries and gardens ...	4,700,000	4,500,000	200,000	—
4. Forage ...	1,700,000	1,700,000	—	—
5. Clothing, etc. ...	900,000	960,000	—	60,000
6. Equipment of young officers, doctors, etc., on joining ...	56,000	38,000	18,000	—
7. Riding instruction for young cavalry and artillery and for regimental and general staff officers ...	20,000	12,300	7,700	—
8. Training of troops ...	10,000	20,000	—	10,000
9. Training of horses, introduction of new saddles ...	90,000	111,830	—	21,830
10. Up-keep of arms and ammunition ...	30,000	45,000	—	15,000
11. Purchase of matériel ...	30,000	44,000	—	14,000
12. Maintenance of transport matériel ...	20,000	40,000	—	20,000
13. Military hospitals, etc. ...	119,000	119,000	—	—
14. Schooling, prizes, etc. ...	60,000	69,460	—	9,460
15. Increase of students in officers' schools ...	45,000	45,000	—	—
16. Up-keep of arsenals ...	40,000	46,680	—	6,680
17. Wood matériel for arsenals, etc. ...	10,000	10,000	—	—
18. Heating, lighting, musical instruments ...	460,000	650,700	—	190,700
19. Barrack improvements ...	72,000	72,000	—	—
20. Cost of burial of deceased soldiers ...	6,000	6,000	—	—
21. Religious instruction ...	22,200	22,200	—	—
22. Purchase of horses ...	50,000	150,000	—	100,000
23. New buildings, stables, railways etc. ...	370,000	370,000	—	—
24. Military heavy transport ...	30,000	30,000	—	—
25. Lodging and table allowances ...	200,000	200,000	—	—
26. Up-keep of ships and naval staff ...	100,000	130,000	—	30,000
27. Coal for ships ...	70,000	70,000	—	—
28. Printing regulations, etc. ...	15,000	15,000	—	—
29. Medical purposes ...	38,000	38,000	—	—
30. Soldiers' libraries, etc. ...	7,250	7,250	—	—
31. Surveys ...	2,000	2,000	—	—
32. Geographical Institute ...	10,000	10,000	—	—
33. Fortifications, etc. ...	12,000	12,000	—	—
34. Remount depôts ...	8,000	8,000	—	—
35. At personal disposal of the War Minister ...	15,000	15,000	—	—
36. Unforeseen expenditure ...	3,000	3,000	—	—
37. For lost legal proceedings ...	5,000	—	5,000	—
38. Washing, etc., at Military schools ...	6,000	6,000	—	—
<i>Extraordinary Expenditure.</i>				
39. Unforeseen expenditure ...	—	20,000	—	20,000
40. Re-introduction of valise, and introduction of artillery equipment ...	200,000	134,250	65,750	—
41. Introduction of new live and blank cartridges from existing matériel ...	84,000	200,000	—	116,000
42. 2 per cent. of the expenditure of all the items excepting Nos. 35 and 36 ...	190,000	195,330	—	5,330
43. To cover excess of expenditure of preceding year ...	102,582	—	102,582	—
Total ...	20,430,892	20,327,020	722,872	619,000

In addition to the above a special credit of 500,000 levas was voted for the grand manœuvres at Shipka. The budgetary strength of the Bulgarian Army for the official year should amount to 2,430 officers and officials, and about 43,000 non-commissioned officers and men; whether however these figures will be actually attained, must remain doubtful, especially as regards the numbers of the officers, as the latter have hitherto been invariably under the budget strength.—*Internationale Revue über die Gesamten Armeen und Flotten.*

DENMARK.—*War Budget for 1902.*—The ordinary expenditure of the War Budget, 1901-02, amounted to 10,227,916 kronen (1 krone = 1s. 0 $\frac{1}{2}$ d.), of which the following are the principal items:—

	Kronen.
Pay and allowances	5,389,282
Remount and forage	1,073,886
War matériel	*917,400
Fortifications, new buildings, etc.	516,415

The extraordinary expenditure amounted to 206,700 kronen, of which the following are the chief items:—

	Kronen.
Trials and Experiments	50,000
Smokeless Powder	20,000
Shields for Copenhagen Fortress	25,000
Further introduction of 8-mm. guns	50,000
Matériel for Cartridges for do.	20,000
Buildings	12,700
Uniforms	20,000
Engineer Matériel	9,000

GERMANY.—*Foreign Trade in Weapons for War.*—As regards Germany, in discussing the export trade of weapons for war, it must evidently be a question concerning the export of arms from German manufactories to foreign Powers, and not of the importation of foreign products into Germany, for, from this latter point of view, thanks to national and private enterprise, the German Empire is self-supporting. This is especially so with regard to small arms, in the development of which industry Germany takes a preponderating position. France, England, and Russia manufacture their own rifles independently of Germany. As regards other States, with rare exceptions, they make up the deficit in Germany, unless they pay for licences to take out German patents. Amongst other countries, making an exception to this rule, is Japan, who has been able to procure a model of the German rifle without the payment of any licence.

The number of arms imported into foreign countries naturally varies with the preparation for war, and if war is or is not taking place in some part of the world. This is also the case when some State is re-arming its forces. Thus it is seen, in the following table, that during the period between 1889 to 1901, the number of exports varied from 3 to 25 million marks. The official

*In this amount is included 275,000 kr. for arsenals and laboratories; 113,500 kr. for purchase and upkeep of fire-arms, bicycles, etc.; and 60,000 kr. for experiments and new matériel for construction.

statistics show the value of arms exported from Germany to have been as follows :—

1889	...	6.5 million marks.	1896	...	25.4 million marks.
1890	...	7.7 " "	1897	...	3.6 " "
1891	...	3.2 " "	1898	...	5.0 " "
1892	...	11.4 " "	1899	...	10.0 " "
1893	...	19.4 " "	1900	...	8.8 " "
1894	...	7.6 " "	1901	...	7.8 " "
1895	...	25.5 " "			

During the above-mentioned period, therefore, the value of the exported arms amounted to 142 million marks. These numbers refer principally to new arms from the large German foundries; nevertheless, this trade also includes large exports of out-of-date weapons. Formerly the military administration was in the habit of returning to the manufacturers the old arms that had been replaced by more modern engines, and the manufacturers were able to easily place these goods with native or Asiatic countries. Thus a large quantity of the old models 71 and 81 infantry rifles were disposed of to the Chinese Army. For some time, however, the War Department have abandoned this practice.

Down to the last few years, Turkey came first amongst the Powers who drew their supply of arms from Germany. From 1889 to 1896 the latter country supplied Turkey with arms to the extent of 40 million marks. China took second place; she spent 25 million marks on rifles, many of them out of date, from 1892 to 1899. From 1894 to 1899, and chiefly during the war with Cuba, Spain expended 15 to 16 million marks for firearms from Germany. The value of the arms furnished to South Africa from 1896 to 1899 amounted approximately to 3 million marks. The next most important buyers are the South American States. Thus, during the last ten years, the Argentine Republic has spent about 17 million marks in Germany; Chili drew from the same source, during the last seven years, about 10 million marksworth of rifles. It was especially during the year 1895 that these two States gave their largest orders for war *matériel* to Germany. In 1898 Mexico received rifles to the value of about 2 million marks, and in 1893 Uruguay spent about 1 million marks on small arms. Canada even, from 1891 to 1893, spent about 1 million marks on rifles from German manufactories. During the last two years, Venezuela, Peru, Columbia, Bolivia, Sweden, and Servia have placed important commissions in Germany. In 1900 they received war *matériel* to the extent of 2½ million marks, and during the last two years Servia has spent from 5 to 6 million marks on German products.—*Allgemeine Zeitung*.

Army Recruiting in 1901.—The official report of the recruiting operations has recently been published, and shows the following results :—The Revision Boards examined 1,198,499 young men, thus distributed :—

Men of 20 years of age (seen for the first time)	...	513,947
" 21	...	340,888
" 22	...	263,911
Older men	...	79,753

As will be seen, the annual contingent amounts, in round numbers, to 514,000, and one sees how great is the number of those put back by the number of men of 21 and 22 who came up again. Amongst the total number of men inscribed on the list, the following were not examined, viz. :—49,244 who could not be found, and 86,722 who failed to appear, making a total of 135,966 men. There were thus 1,062,533 men actually

examined, of whom 1,219 were debarred from service, 41,332 were physically unfit, and 564,127 were put back. In addition, 100,071 men were attached to the 1st Levy of the Landsturm, 83,310 to the Ersatz Reserve of the Army, and 1,035 to the Ersatz Reserve of the Navy. The following were declared fit for service :—

99,310 men 20 years of age
 54,615 „ 21 „
 71,993 „ 22 „
 2,488 older men. Altogether 228,406 men.

Further, 13,674 recruits were classified in excess of establishment in order to replace any possible deficiencies amongst those declared fit for service. A total of 48,986 men were enlisted in the Territorial Army, and 3,129 in the Navy. Amongst these the number of one year voluntary enlistments amounted to about 11,000 men.

The 228,406 men enlisted were distributed as follows :—

Territorial Army (combatant branch) ...	215,479
„ „ (non-combatant branch) ...	4,701
Navy ...	8,226

The total number of those enrolled in the Territorial Army in 1901, therefore, amounted to 220,180 men who were called up, and 48,986 who enlisted, amounting altogether to 269,166 men. The number of re-engagements, in round numbers, amounts to 80,000 men.—*La France Militaire*.

ITALY.—*War Budget for 1903-1904*.—The expenditure provided for the War Budget for the financial year 1903-04, including pensions, and not including expenditure for troops quartered outside the kingdom, is as follows :—

	Lire.
1. Ordinary Expenditure ...	223,931,000
2. Life Pensions ...	35,069,000
3. Extraordinary Expenditure ...	16,000,000
4. Transfer of Funds to be added ...	6,931,421
Total Expenditure ...	281,931,421

If from Nos. 1, 2 and 3 (which amount to 275,000,000 lire) are deducted the receipts of the Treasury, the expenses of the Carabinieri, musketry, and life pensions, which represent a sum of 69,034,017 lire, it will be seen that maintenance of the Regular Army costs the State 205,965,983 lire, thus distributed :—

	Lire.
Ordinary Expenditure ...	189,965,983
Extraordinary Expenditure ...	16,000,000
Total ...	205,965,983

This budget scheme allows an interesting comparison to be made between the organic and the budgetary effectives.

Items.	Organic effective.	Budgetary effective.	Difference.
Officers ...	14,193	13,788	405
Rank and file ..	266,800	204,502	62,298
Officers' chargers ...	11,555	8,648	2,907
Troop horses ...	40,152	36,656	3,496

Amongst the 16,000,000 lire for extraordinary expenditure, 5,500,000 lire are provided for the manufacture of new artillery *matériel* during the financial year 1903-04. Consequently, the total of expenditure on this *matériel* amounts to the following :—

Year.							Lire.
1900-01	...	...	...	...	...	...	8,000,000
1901-02	...	...	...	...	...	...	9,900,000
1902-03	...	...	...	...	...	...	9,500,000
1903-04	...	...	...	...	...	...	5,500,000

As the total expenditure provided and authorised for the reconstruction of artillery *matériel* amounts to 60,000,000 lire, to be spread over six years, it follows that for the two remaining financial years, the War Minister will have 27,100,000 lire at his disposal.

Finally, the budget provides for the calling to the colours of about 89,000 men, who will come up for a period of instruction of 20 days.

The *Italia Militare e Marina* states that the Italian troops in Erythrea consist of 196 officers and 1,136 men of the Italian Army, and 5,547 natives; making a total of 6,789, the number of horses being 1,362. In a measure introduced into the Italian Chamber by the Italian Minister of Foreign Affairs, it is proposed to reduce the number of troops to 4,912, consisting of 139 officers and 671 men of the Italian Army, and 4,102 natives; the number of horses being reduced at the same time to 902. The proportion of the proposed reduction is larger in the cavalry and artillery than in the infantry, as in the mountainous country of Erythrea the last are found to be the most useful. Part of the reduction in the number of troops is to be effected by the transfer of some of the duties performed by the military to civil servants.—*La France Militaire*.

JAPAN.—*Cadet Corps*.—There are 1 Central and 6 Provincial Cadet Corps in Japan. The 6 latter were all raised at the same time in 1896, and have their headquarters at Tongo (station of the 1st and of the Guards Divisions), at Sendai (station of the 2nd Division), at Nagoza (station of the 3rd Division), at Olsana (station of the 4th Division), at Hiroshima (station of the 5th Division), and at Kumamoto (where the 6th Division is quartered). The commanders of each provincial cadet corps is a major, and has a 1st lieutenant as his adjutant. In addition, there is also a doctor and a pay master. A captain and two 1st lieutenants look after the military pupils, whilst, as a rule, 6 to 10 ordinary and 6 to 8 assistant instructors supervise the civilian pupils. The course in these corps is for 3 years. Boys of over 13 and under 15 years of age are taken into a provincial cadet corps, after they have passed a physical and a mental examination. Boys under 14 must be 4 feet 4 inches in height; those over 14 must be at least 4 feet 5½ inches tall. The subjects for examination are :—Reading, composition, elementary arithmetic, geography, and history of Japan, elementary physics, and free-hand drawing.

Sons of officers, and of higher officials, of the Army and Navy, who have fallen in action or who have died in consequence of wounds, are brought up at State expense; sons of officers of the Army and Navy who have died in the performance of their duty, also sons of retired officers, and sons of higher State officials who have performed distinguished service for the State, may also be admitted at State cost to cadet corps, only sons of families in good circumstances being excluded from being received free of cost. Sons of subaltern officers on the active or retired list pay half the expenses, viz. : each cadet on joining pays 10 yens (1 yen equals 2 shillings) for clothing, and a

further monthly sum of 3½ yens. Other cadets, with the exception of those maintained at State cost, pay 30 yens on joining for clothing, and 6½ yens monthly. About 100 cadets are received yearly into each provincial cadet corps.

The curriculum of instruction for civilian pupils in provincial cadet corps includes the following subjects, viz. : Ethics; the Japanese language (reading grammar, composition, writing); old Chinese; French; German or Russian; history of Japan and of the world; geography of Japan and of the world; arithmetic; algebra; geometry; zoology; botany; physiology and hygiene; physics and chemistry; drawing; imperial edicts for soldiers. The military pupils receive instruction in the following, viz. : Military salutes; drill in detail; free gymnastics; gymnastic exercises with clubs; imperial edicts; articles of war; subordination; military behaviour; badges of rank of officers, non-commissioned officers, private soldiers, and officials of the Army and Navy; dress of the Army and Navy; to command and to obey; sorts and origin of orders; various kinds of flags and colours. Only native instructors are employed for teaching languages.

The headquarters of the Central Cadet Corps are at Tongo. The commander is a colonel or a lieutenant-colonel, and he has 2 adjutants, a captain, and a 1st lieutenant, to assist him. In addition to the above, the corps has a doctor, a veterinary surgeon, and a paymaster. There are 29 civilian instructors and 11 assistant instructors. The military instructors consist of 3 captains, 8 1st lieutenants, and 1 riding master. The Central Cadet Corps was already in existence in 1872 as an ordinary cadet corps. It first received the title of "Central Cadet Corps" in 1896. The course there is a two years' one. Its cadets are only made up from those who have already gone through a course at a provincial cadet corps. At the present time there are 531 cadets at the institution. As in provincial, so also are there 3 sorts of cadets in the Central Cadet Corps, viz. : those maintained at State cost, those paying half expenses, and those paying the entire cost. Cadets at half cost pay 8 yens for clothing on joining, and 3½ yens monthly; those paying full cost are charged 24 yens for clothing on joining, and 7 yens a month. The cadets are divided into 3 companies, each under a captain. Civilian pupils are instructed in ethics, Japanese, old Chinese, French, German or Russian, Japanese and European history, algebra, geometry, trigonometry, physics and chemistry, drawing and painting. The military pupils are taught drill in detail, free gymnastics, gymnastic exercises with clubs, preliminary musketry, field service, judging distance, shooting, fencing, riding, bugling, training in marching, swimming, company drill, garrison duty, infantry fortifications and interior economy, infantry drill regulations, musketry regulations, field service regulations, specification of all arms, saddlery, management, knowledge and training of horses, military law, discipline, organisation, field works, aid for the wounded, and rules of the Geneva Convention. French and German are taught by foreigners. These cadets, as those of provincial cadet corps, live in the cadet house alone, and are only allowed out on festivals. They only have holidays once in summer and once in winter. In August two weeks are devoted in swimming exercise on the sea-coast. All drinking of wine, beer, etc., as well as smoking, are strictly forbidden. After passing through the Central Cadet Institution the youths become candidates for commissions.—*Internationale Revue über die Gesamten Armeen und Flotten.*

NETHERLANDS.—*Army Budget for 1903.*—The Netherlands Army Budget for 1903 amounts to 25,202,456 florins, an increase of 1,449,492

florins over that of the preceding year. The credits are distributed as follows :—

	Florins.
Headquarter Administration	166,250
Staff and various Services (pay and allowances)	262,580
Regimental Officers (pay and allowances)	3,273,587
Rank and File (pay, allowances, clothing, instruction, etc.)	7,923,843
Medical Service	840,876
Military Schools	393,285
Artillery	2,105,680
Engineers	982,600
Commissariat	2,938,332
Clothing, Equipment, Harness	553,210
Military Topography	71,098
Military Transport	324,400
Various Expenditures	123,820
Pay for retired and unemployed men, Pensions, etc.	2,593,075
Unexpected Expenditure	50,000
Gendarmerie	816,970
Extraordinary Expenditure	666,350
Supplementary System of Fortification	1,116,500

Total 25,202,456

—*Revue Militaire.*

SWITZERLAND.—*Automobile Trials in the 1901 Manœuvres.*—The *Revue Suisse Militaire* gives an account of the experiments which took place, with different models, at the 1901 manœuvres. The examination and selection of the machines, which should come from the best-known firms, was confided to a military board. Automobiles of Swiss manufacture were eliminated from the experiments, as it was considered that the question was one for the general interests of the Army, and not a commercial competition.

The selection of the Board fell on the five following cars :—

1. A Peugeot phaeton with 4 seats (8-H.P.). Price, 8,000 francs.
2. A Panhard-Levassor carriage (12-H.P.). Price, 15,000 francs.
3. A Daimler carriage with 4 seats (10-H.P.). Price, 15,500 francs.
4. A heavy Peugeot truck, to carry 2,500 kgs., or about 2½ tons (8-H.P.). Price, 8,000 francs.
5. A light Peugeot truck, to carry 1,500 kgs., or about 1½ tons (8-H.P.). Price, 8,000 francs.

The three first vehicles were assigned to the Staff, the heavy truck to a commissariat detachment, and the light one to a battalion of carabiniers. The object of the trials was to study a new means of locomotion, of three descriptions, from three different points of view, viz. :—

1. The three carriages for the transport of individuals, as a means of facilitating and accelerating the staff service of corps, and of the combined arms.
2. The light truck, as a vehicle to replace the battalion cart.
3. The heavy truck, as an automobile to take the place of heavy baggage trains.

The following table shows the rates of progress and the distances accomplished by the different vehicles :—

Description.	Maximum rate per hour.	Total distance covered.	Average rate per day.	Maximum rate per day.
	Miles.	Miles.	Miles.	Miles.
Peugeot phaeton	20	637	45½	61
Panhard-Levassor carriage ...	25	462	30	59½
Daimler carriage	18½	414	30	56
Heavy Peugeot truck... ..	9½	177½	12½	31½
Light " "	9½	317½	22	38

In spite of the soft roads and most unfavourable weather, they were able, during the 14 days for which the manœuvres lasted, to thoroughly satisfy all requirements. The only fault to be found was that the large pneumatic tyres were unsuitable, and that the trials had to be carried out with solid and durable tyres. The light Peugeot truck rendered excellent service to the carabinier battalion. Not only was the provisioning carried out with despatch, but it was possible on two occasions, in addition to its ordinary service, to use the truck for the transport of large sums of money on pay-days, without interfering with the provisioning. In its report to the Federal Military Department, the Board recommends :—

1. The substitution of automobile trucks for the heavy transport wagons.
2. The acquisition of some Peugeot trucks, which would be used at different depôts of arms, and the trial of a Scotte traction engine.

As regards army requirements, the Board is of the following opinion :—

1. That 3 machines should be at the disposal of an army corps commander, viz. : 1 for himself and his chief of the staff, 1 for other officers of his staff, and 1 for his armed escort.
2. That 1 machine is sufficient for a divisional staff; but it should also have a spare machine at its disposal, as every automobile, after 3 or 4 days' use, requires half a day for overhauling and repairs.
3. The Inspector and Director of the Manœuvres should also have an automobile car.
4. Two light trolleys should be attached to a battalion, 1 for the transport of provisions, and the other for cooks and their materials. This would permit of the distribution of food to a battalion on its arrival in camp.
5. Chauffeurs should be trained, and an officer should be attached to each army corps for the supervision of the carriages.

The Board is also of opinion that by encouraging the use of automobiles in private enterprise—by the organisation of automobile races, and by employing this type of wagon in the postal service, etc.—it would have at its disposal in war time a large number of automobiles on requisition. Finally, whilst proposing to renew experiments in 1902, the Board expresses the hope that the Federal Military Department will gradually acquire the necessary *matériel* to permit of mechanical traction taking the extended sphere in military institutions for which it is fitted.

UNITED STATES.—*The Springfield Magazine Rifle*.—General Crozier, Chief of Ordnance, ordered the Springfield Armoury to manufacture 5,000 rifles of a new model, which will be distributed to the Army and thoroughly

tested. It is proposed to gradually retire the Krag-Jorgensen arm. The new rifle retains the essential features of the Krag, but is simpler and stronger, and has an increased muzzle velocity. It can be used either as a single-loader or as a rapid-fire magazine rifle. The present stock of Krags will be distributed to the militia of the several States, but this will not occur until the entire Army has been supplied with the new arm.

The new weapon incorporates the best points in the Krag-Jorgensen, the present Army rifle, and the Mauser, used by Germany, Spain, and many other countries, and is the result of the best inventive ingenuity at the Government's command, and a long and exhaustive series of tests and experiments. This type of rifle is a clip-loading magazine rifle, embodying features of the Mauser equally with the Krag-Jorgensen weapons, the bolt being furnished with front locking lugs, as in the former arm, while it retains the safety rib and the firing-pin mechanism of the existing U.S. Service rifle. The magazine is of the box type, and projects from the wood of the fore-end in front of the trigger-guard, the guard, indeed, forming part of its structure. It is furnished with a cut-off, very similar to that of the Lee-Enfield.

Its calibre is .30, the same as that of the present rifle, and it fires a rimless cartridge. The weight of the bullet, 220 grains, is the same as that of the present Service cartridge. The new rifle gives a muzzle velocity of 2,300 feet per second, which is remarkably high. This combination gives it a muzzle energy which makes it the hardest hitter among the military rifles of the world.

These high qualities give it the following advantages over the present Service rifle, and over the Spanish and German Mauser, recently adopted:—First, a flatter trajectory, or path of projectile, with consequent greater accuracy; second, greater striking energy at all ranges, on account of the density of this heavy bullet more readily overcoming the resistance of the air; third, greater penetration; fourth, greater range.

A board of Ordnance officers, appointed to examine and test this new rifle, have reported the following as its advantages when compared with the Krag-Jorgensen—that it is considerably stronger than the Service arm, since, while retaining the safety rib, the bolt is provided with the two forward locking lugs already referred to, and the barrel is heavier over the chamber. Also the firing-pin mechanism is as strong and simple as that of the Service arm, while by means of a sleeve the striker is held more securely in place. As regards simplicity, the new rifle possesses fewer parts, and would be somewhat cheaper to make than the Service arm. The cam surfaces for extraction and for final compression of the main spring are larger and less liable to wear.

As regards the other side of the question, the board points out that the magazine projects considerably below the stock, and, besides being unsightly, is thereby liable to damage. The cut-off is not satisfactory, and the magazine cannot be loaded with the cut-off in use. It is suggested to substitute a form of magazine similar to that of the Spanish Mauser, having the cartridges disposed in zig-zag fashion within the limits of the woodwork of the stock, and with an arrangement for lowering it to secure the cut-off, as in the Schmidt system. The board also recommends the substitution of a cannellured cartridge for the pattern with projecting rim, which is difficult to carry in a clip, and liable to jam in action owing to the rim of one cartridge engaging with that of the one below it. These points were brought out by a series of exhaustive tests which were made at the close of the year 1900, and which are now published in the Report of the War Department, 1902, Chief of Ordnance. The tests were of the usual complete character

enforced by the U.S. Ordnance Board, and at the close the conclusion arrived at was that the arm had successfully passed the test to which it had been submitted, the minor difficulties which were experienced being only such as might reasonably be expected in the case of a new rifle which had not been previously tested.—*Précis from Arms and Explosives.*

New Small Arms Firing Regulations.—The Board on Revision of the Firing Regulations for Small Arms has now been in session since 24th November, and has practically decided upon the main points of change to be recommended for the revised regulations for small arms firing.

The original instructions upon which the work of this Board is based enjoined upon the Board the importance of reviving the old-time interest in target practice. All field officers and the majority of captains can remember the time when, the "season" having arrived, our whole Army became absorbed for months at a time in target practice. In those days the allowance of ammunition was abundant, and the amount of practice indulged in was limited only by the number firing and the duration of the season. Then, later, came the magazine rifle, a reduction in the allowance of ammunition, and a corresponding change in the course. The Spanish-American War and the Philippine Insurrection followed, and from 1898 to 1901 target practice was practically discontinued. In 1892 the practice was resumed, and the unsatisfactory results which followed were considered due partly to the inexperience of the troops, partly to the meagre allowance of ammunition, and partly to the course itself. Whatever the cause, the results were not entirely satisfying, and the interest was luke-warm. The Board is expected to correct the defects of the present system, and devise a course that shall stimulate interest and secure an army of marksmen comparable with that of the late '80's and early '90's.

The great success in our rifle practice in those days was due principally to the influence of the able works on the subject by Captain (now Major) Stanhope E. Blunt, Ordnance Department, U.S.A. The first work of this officer, published in 1885, was so perfectly and thoroughly done that, with some slight revision, it remained the guide and text for the Army until the introduction of the magazine arm necessitated some changes. In the revision of the present system the Board has returned to many features of practice as taught by Blunt.

The arrangement of the subject matter in the manual will be somewhat altered, and an endeavour will be made to tabulate the prescribed course of firing for the several small arms, so as to facilitate study of the course and reference to any point or requirement included therein.

While the methods followed in the course for estimating-distance drills—an important feature of the soldier's education—are not materially charged, the course itself will be compulsory for all; and prescribed degrees of proficiency in this, as well as in the course of actual firing, will be required for qualification in the several classes of marksmanship.

For the rifle and carbine there will be three courses—marksman's, sharpshooter's, and expert rifleman's. In each, except the expert rifleman's course, there will be "instruction" (preliminary) and "record" practice. In the instruction practice latitude will be given the instructor in the amount of ammunition expended upon each soldier, the idea being that a saving may be made on excellent and experienced shots, to be expended on poor and inexperienced ones. This practice will be completed throughout before record practice is begun.

The marksman's course is divided into slow-fire practice, rapid-fire practice, and skirmish practice. In the slow-fire practice a circular bull's-

eye target will be used; in the rapid-fire, a rectangular-figure target; and in the skirmish practice, a group target.

In the sharpshooter's course long-range slow-fire at the bull's-eye target is employed.

In the expert rifleman's course slow and rapid fire at the bull's-eye target and skirmish fire at the group target are employed. In skirmish the firing is completed on the advance at 200 yards, no retreat being prescribed; the standing figure is eliminated from the group; the position at all ranges is optional with the soldier (prone, sitting, or kneeling). The number of shots fired are two at 600 and 500 yards each; three at 400 and 300 yards each; and ten at 300 and 200 yards together. When the soldier halts at 300 yards he has ten cartridges left—five in magazine and five in belt. The time limit at 300 yards is thirty seconds, and at 200 yards twenty seconds, and the soldier may distribute the firing of these ten rounds between the two ranges as he sees fit, loading one or more cartridges from his belt after emptying the magazine if he desire, and thus firing six or more cartridges at either range, and the balance of the ten at the other. Those making the necessary record scores in slow-fire, rapid-fire, and skirmish-fire practice, marksman's course, will be advanced to the sharpshooter's course, which consists of instruction practice and record practice at 800 and 1,000 yards.

This course finished, those making the necessary scores in the record practice therein will be advanced to the expert rifleman's course. In this there is no instruction practice, but a short record test of slow, rapid, and skirmish fire, the object being to secure a special class of expert shots, to whom will be awarded a prize of additional pay, a distinguishing pin, and, possibly, a telescopic sight.

The percentages required for qualification in the several classes have not yet been determined, and will depend to some extent upon the reports to be received from officers now conducting tests of the prescribed system at several posts.

In the course of pistol practice recommended there will be an extension of both mounted and dismounted practice, and an increased number of shots fired. However, as part of this practice will be rapid-fire, the time for its completion will probably be decreased.

Reports.—The Figure of Merit will be re-adopted.

Competitions.—Officers' competitions are abolished; and officers will compete in the Department and Army competitions for enlisted men.

Medals.—The Army and Department medals have been changed in size, weight, and design; the size being smaller, the weight less, and the design symbolical of the object for which awarded.

Expert Rifleman.—The Appropriation Bill provides for extra pay of one dollar per month for soldiers qualifying as expert riflemen.

Contests.—The Board will recommend the institution of monthly contests in firing at every post practicable, the days to be selected by Department commanders, and the contests to be conducted under rules prescribed by the Board.

Supplemental Practice.—A course of supplemental practice on one month will be prescribed for the instruction of recruits joining after the regular practice season of three months.

Ammunition.—The allowance of ammunition will be considerably increased; and it will be recommended that a special quality of ammunition be manufactured for use in competitions.

Revolver.—The Board will recommend that the Service revolver be improved in several respects, as in the shape of the butt, the side on which

the cylinder is opened for loading, the space between the cylinder and barrel the pull of the trigger.

Positions, etc.—The back position is prohibited, and the use of the gun sling is permitted, at all ranges. Sighting shots are required in record practice at certain ranges.

Targets.—The circular bull'-eye target is adopted for the appropriate class of firing, and the dimensions of the targets are the same as laid down in Laidley's Course of Instruction in Rifle Firing in 1879, except in the case of the mid-range target, wherein the bull's-eye is reduced to 20 inches in diameter, the centre ring to 37 inches, and the inner ring 53 inches. In the group target the standing figure is eliminated.

Badges.—The marksman's button will be re-adopted, and the expert rifleman will be awarded a bar marked "Expert Rifleman," from which will be suspended the bar and cross of the sharpshooter.

In addition to the above changes, the Board will introduce certain others not yet definitely settled upon, and will recommend the adoption of a special course for the use of the National Guard or Volunteers, or in other cases wherein time and ammunition may be limited. In this connection, as well as in connection with the general subject of small arms practice, the Board has consulted freely with representative officers of the National Guard with the view of adapting the course for the Regular Army to the conditions of the Guard so far as compatible with the interests of the Service.

The Board has been directed also to include within its revised edition of small arms firing regulations certain matters heretofore treated of in "Infantry Fire: Its Use in Battle."

Besides the work of revision referred to the Board, it is learned that the general subject of extension and improvement of State and Rifle Association target range has been placed in its hand for examination and report, and the Board is now in communication with all States and Territories on this subject. It is hoped that this work will not delay the issue of the revised small arms regulations; but if it should, the practice for the coming season will not be materially interfered with, as the Board will soon recommend the issue of a general order containing the revised course in a condensed working form.—*U. S. Army and Navy Journal*.

CORRESPONDENCE.

A REPLY TO MAJOR H. DE B. HOVELL'S CRITICISM ON "CONTINENTAL *versus* SOUTH AFRICAN TACTICS," BY LIEUT.-COLONEL MAUDE.

To the Editor of the JOURNAL OF THE ROYAL UNITED SERVICE INSTITUTION.

SIR,—Major H. Hovell's comments on my paper, "Continental *versus* South African Tactics," hardly deserve a reply, but as they furnish a most striking instance of the consequences a want of scientific education may lead to, and undoubtedly has led to in a very large number of instances, I beg your permission to deal with them in order.

Major Hovell makes the initial mistake of confusing "personal impressions" with "facts." It is as if a man were to attend a spiritualistic seance and to come away convinced that the ordinary laws of gravitation and of matter were non-existent because his senses had caused him to see heavy bodies suspended in mid-air without means of support, etc., etc.

He accuses me of stating many fallacies, and demands a strong proof from me in support of my position, coupling the demand with a sneer at my want of personal experience. The latter may pass—no doubt I should have been as much or more affected by personal impressions as my critic; but the essential point is, that however much impressed I might have been, or however far I might have run away from the scene of these impressions, as soon as I recovered my wits and my breath, my intellect would have refused to allow me to count as facts the impressions which the figures showed me to be unfounded.

I commenced these studies some twenty years ago, being attracted thereto by the extraordinary fact that in spite of the manifest mechanical advantages of the breech-loader, and as an engineer I was naturally biased in favour of the mechanical aspect of the question, it did not, under similar and fairly comparable circumstances, do equal man-killing work.

The statistical evidence was overwhelming, but I could find nothing in the quality of the men, or the tactics, which would in any way explain this result. The men in 1870 on both sides were much better trained and disciplined in the ordinary sense of the word than the French, Germans, and Austrians from 1807 onward to 1815. Our own troops in Afghanistan, Zululand, and the Soudan were certainly no worse than the average of our native and British regiments at Meanee and in the Sikh wars, and the tactics throughout bore a family likeness to one another; yet mistakes and blunders on the beaten side always encountered swifter and more terrible punishment in the past than in the present, from Waterloo to Magersfontein and Colenso. I would add that I have never allowed my racial prejudices to interfere with my tactical judgment.

Finding no sufficient answer in military history, I then turned my attention to the weapon itself, and after many consultations with some of the ablest mathematicians in the Army, or out of it, I hit on the demonstration given in my lecture, and I submit that if it be carefully and scientifically dissected it will be found to hold good as long as bullets obey the ordinary laws of motion and matter. To disprove it, it must be shown that a bullet can be in several places at the same time, or that twice two does not always make four—nothing less will suffice.

It is, of course, true that targets vary in action. I have discounted that obvious reflection by making a comparison between similar targets only. When I come to differentiate between targets I shall have a very different picture to present; but that was outside the scope of the lecture under discussion.

I also admit that "close misses" have their influence. But were there no "close misses" in former warfare? I imagine that they were about as numerous at least, and submit that that was the chief reason why our war-seasoned old veterans of the Peninsula laid such stress on absolute steadiness in the fighting line; on this point I prefer the Duke of Wellington's and Sir Charles Napier's views to Major Hovell's.

Major Hovell next states that "good shots will produce a very useful fire effect at two thousand yards at the rate of 10 rounds a minute." The question here is, What is a "useful effect" in relation to the number of rounds fired? I can find no trace of anything which would have been considered "useful effect" by the disciplined soldiers of a century ago in the figures so far accessible of the present war. As regards the rate of fire I fixed as likely to give the best return for rounds fired, such experiments as I have been able to make convince me that my figure is not above the mark. Of course, you can fire more rounds; but what is the use of wasting them?

Of course, "fire intensity is directly proportionate to its accuracy"—the two phrases cover one another—but accuracy depends on steadiness of hand, eye, and nerves, and it is the special function of the drill-ground training to improve these by giving the soldier a greater degree of will control over these members than he naturally possesses. Major Hovell falls into the error permissible enough in the civilian advocates of Rifle Clubs, but curious in a soldier, of mistaking the mechanical teaching of the ranges for the psychological effect created by the drill ground—two widely different conceptions; but experience has abundantly proved that the maintenance of "coolness in action" is far more the consequence of the mutual confidence engendered

between man and man, men and leaders, than of individual skill in the use of the weapon.

Let me give a striking instance, which has only recently come to my notice, in support of this contention.

At Weissenburg, 4th August, 1870, the French went into action under the unfavourable condition of surprise; but they were disciplined men, with full confidence in one another, and, at any rate, most of their leaders. They killed or wounded one German for every 250 rounds fired. At Woerth, two days later, confidence being shaken a good deal, the average fell to about 450 per Prussian. Around Metz a fortnight later it got down to 1,000 rounds per Prussian, and subsequently, on the Loire, we find it down to 100,000 at the very least. Yet targets, time of exposure, and degree of preliminary musketry training remained practically the same.

As for my statement that "in the course of a combat the accuracy of fire falls off to an almost incredible degree," I adhere to it, only pointing out that I was referring to downright hard fighting, with losses up to 20 per cent. and over. Even if the troops on Spion Kop shot better at the end of the day than at the beginning—which I should have some difficulty in believing—I submit that that would be no guide to what their shooting would have been after an equal number of hours under the fire of 70 instead of 7 guns, not an improbable European contingency.

In the next paragraph I plead guilty to the slip of giving the extreme range of the Lee-Metford as 3,000 yards. I had no tables at hand, and, in fact, do not know whether any one ever has measured or calculated the range of that rifle at maximum elevation. I took the height of trajectory at rather less than one-third the range, a sufficiently good rough rule; but the greater the range the stronger my argument, and the closer the analogy to the "water hose."

A propos of the Boers' skill with their rifles, I was informed by many of my old friends who went through the '81 campaign and Zululand, that the Boers' average range for buck shooting was seldom below 600 yards; but if the range was only 150, and if Mausers were only issued just before the war, what becomes of Major Hovell's theory of the value of range training for accurate shooting? The Lee-Metfords were issued to us a long time before the war, and our men's teaching was sound in theory as far as it went. Is Sunday shooting at targets on the "go as you please" style really better for making marksmen than a carefully thought-out system of training? Saturday afternoon shooting I know of my own experience to be pretty useless; but perhaps there is something in the day.

I am obliged to Major Hovell for pointing out that our rifles are "under-sighted or over-sighted" at 5,000 feet above the sea. I learnt that elementary fact in gunnery at Woolwich thirty years ago, and verified it by direct experiment in the hills in India at odd times during several years. Still, I am grateful for the kindly intention.

I absolutely demur to the statement that "modern rifles determine battles without the combatants coming to close quarters," as deducible from the last war, for the simple reason that there has been no "battle," in the strict sense of the word, in the whole of our campaigns. In the whole series of magnified skirmishes the tactical conditions have been conditioned by the facility of evasion retained by the other side; but take away that facility and substitute disciplined infantry for the Boer mounted riflemen, and the old time "form" of battle must again have been the result.

Finally, my argument for the increased advantages of the attack is based not on rapidity of fire nowadays common to all troops, but on the fact that the increase of range in both artillery and infantry weapons facilitates the convergence of such an enormous preponderance of fire on the point selected for attack, that it is possible to create at that point conditions of so terrible a nature that no object the size of a man's head and shoulders can exist out of cover long enough to take aim, even if it could see anything through the blinding clouds of smoke and dust to aim at. How many of our men did the Boers at Pieter's Hill see to aim at, as the attack came on under cover of our great artillery preparation? Yet, under European conditions—I have no book of reference at hand—I imagine the number of guns might easily be doubled, and if that is not enough, then trebled, for a decisive effort.

The central point of the whole argument that Major Hovell misses is this: Given a good cavalry to find the enemy, and an artillery numerically sufficient for the act of preparation (which is no longer viewed as a long-continued bombardment, but only as an overwhelming concentration of numbers of shells over the heads of the advancing infantry); then a general of the three arms nowadays has it in his power to a greater extent than ever before to produce conditions in his enemy's ranks which will actually paralyse and destroy the results of all musketry training in peace.

If nothing is aimed at, very little will be hit, and all the crack shots of Bisley could do nothing against their targets through a London fog; but the gunners can create the conditions of a London fog anywhere whenever they choose—with bullets in it.

F. N. MAUDE,
Lieut.-Colonel, late R.E.

NAVAL AND MILITARY CALENDAR.

JANUARY, 1903.

-
- 1st (Th.) H.M. King Edward VII. was proclaimed King-Emperor at Delhi.
 " " 3rd Bn. West India Regiment left Sierra Leone for Bermuda in the "Orissa."
 6th (T.) 1st Bn. Gloucestershire Regiment left Ceylon for Calcutta in the "Golconda."
 8th (Th.) H.M.S. "Mohawk" commissioned at Chatham for Mediterranean.
 " " H.M.S. "Odin" commissioned at Sheerness for Cape of Good Hope and West Coast of Africa.
 " " The Viceroy of India reviewed British and Native troops under the command of Lord Kitchener outside Delhi.
 " " 2nd Bn. East Surrey Regiment } Left South Africa for India in
 " " 2nd Bn. Shropshire L.I. } the "Syria."
 9th (F.) The Delhi Durbar gathering ended.
 11th (S.) 3rd Bn. West India Regiment arrived at Bermuda from Sierra Leone in the "Orissa."
 12th (M.) It was announced that the President of the Venezuelan Republic had assented to a Conference at Washington prefatory to the submission of all disputed matters to the Hague Tribunal.
 13th (T.) Launch of first-class battle-ship "Constitution" from the Elswick Yard, Newcastle-on-Tyne, for Chilian Government.
 " " H.M.S. "Drake" commissioned at Portsmouth for Cruiser Squadron.
 " " H.M.S. "Venus" commissioned at Chatham as coast-guard ship in Southampton Water.
 " " H.M.S. "Hawke" commissioned at Chatham to convey relief crews to Mediterranean.
 " " 1st Bn. Gloucester Regiment arrived at Calcutta from Ceylon in the "Golconda."
 14th (W.) 2nd Bn. Royal Irish Rifles } Left Cape Town for Ireland
 " " 1st Bn. Royal Welsh Fusiliers } and England in the "Ortona."
 " " 4th Bn. Rifle Brigade }
 15th (Th.) Launch of first-class battle-ship "Libertad" from Messrs. Vickers' Works, Barrow-in-Furness, for Chilian Government.
 " " Launch of first-class armoured cruiser "Suffolk" at Portsmouth.
 " " Government House, Aldershot, was destroyed by fire.
 " " 1st Bn. West India Regiment left Bermuda for Jamaica in the "Orissa."

15th (Th.)	No. 4 Mountain Battery R.G.A.	}	Left South Africa for Egypt in the "Plassy."
" "	1st Bn. Highland L.I.		
17th (Sat.)	H.M.S. "Mohawk" left Sheerness for Mediterranean.		
" "	H.M.S. "Odin" left Sheerness for West Coast.		
" "	2nd Bn. Northumberland Fusiliers	}	Left South Africa for Ireland and England in the "Aurania."
" "	2nd Bn. Norfolk Regiment		
" "	1st Bn. Royal Inniskilling Fusiliers		
19th (M.)	1st Bn. West India Regiment arrived at Jamaica from Bermuda in the "Orissa."		
20th (T.)	H.M.S. "Hawke" left Sheerness for Malta.		
" "	2nd Bn. West India Regiment left Jamaica for Sierra Leone in the "Orissa."		
22nd (Th.)	Announced that new cavalry regiments were to be formed.		
" "	2nd Bn. East Surrey Regiment	}	Arrived at Bombay from South Africa in the "Syria."
" "	2nd Bn. Shropshire L.I.		
23rd (F.)	1st Bn. King's Own Scottish Borderers	}	Left South Africa for Ireland and England in the "Lake Manitoba."
" "	2nd Bn. Duke of Cornwall's L.I.		
" "	2nd Bn. Seaforth Highlanders		
24th (Sat.)	Treaty between Great Britain and the United States, settling the Alaska Question, was signed.		
" "	1st South Lancs. Regiment	}	Left South Africa for India in the "Soudan."
" "	2nd Royal Irish Fusiliers		
25th (S.)	H.M.S. "Drake" left Portsmouth for Las Palmas.		
27th (T.)	1st Bn. East Surrey Regiment left Bombay for England in the "Assaye."		
28th (W.)	2nd Bn. Royal Scots Fusiliers	}	Left South Africa for Ireland and England in the "Staffordshire."
" "	2nd Bn. Middlesex Regiment		
" "	1st Bn. Connaught Rangers		
29th (Th.)	The Pretender, Bou Hamara, defeated by the Sultan of Morocco.		
30th (F.)	No. 4 Mountain Battery R.G.A.	}	Arrived in Egypt from South Africa in the "Plassy."
" "	1st Bn. Highland L.I.		
" "	74th Company R.G.A.	}	Left Egypt for India in the "Plassy."
" "	1st Bn. Seaforth Highlanders		
31st (Sat.)	2nd Bn. Royal Irish Rifles arrived at Queenstown, Ireland, from Cape Town, in the "Ortona."		

FOREIGN PERIODICALS.

NAVAL.

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a Permanent Fortified Work." "The English Provisional Regulations on Combined Tactics" (continued). "Cavalry Scouting from the Revolution to the Present Day" (continued).

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NOTICES OF BOOKS.

Bonapartes erster Feldzug 1796: der Ausgangspunkt moderner Kriegführung. Von KUHLE, Major in Groszen Generalstab. 350 pp., with Maps and Plans. Berlin: R. Eisenschmidt. 1902.

The interest of this work centres in the fact that it is the first history of this epoch-making campaign which has been compiled with full access to the archives of the Austrian Government. Hitherto one has always had the feeling that "one side of a story is good until the other gets a hearing," and, as a consequence, has anticipated that some day opinion as to Austrian incapacity would have to be considerably modified when the secret history was at length revealed: but, curiously, the result is remarkably disappointing. Of all the many accepted opinions that of late have been shown to be untenable by historical research, those current as to the events of 1796, and Bonaparte's superiority over his adversaries, alone escape—and, indeed, show brighter by comparison.

It has hitherto been received almost as an axiom that Austria's misfortunes were primarily the result of undue interference from Vienna with the freedom of her generals in the field. But Major Kuhl assures us that no trace of such interference is to be found. On the contrary, Beaulieu, the Austrian Commander-in-Chief, was left even more freedom of action than Bonaparte, for whom the Directory traced out very definite lines indeed—to which, however, he paid very little attention.

The charge of plagiarism from Maillebois so frequently preferred against the latter, is also seen to fall to the ground; and indeed it becomes difficult to grasp the mental attitude of those who first formulated it. That Bonaparte had studied M. de Maillebois' works, and everything else relating to the proposed theatre of operations is, of course, well known, and goes without saying; but it has been consistently overlooked, especially in England, that the conditions of warfare which determine the strategical action had changed entirely since de Maillebois' time, and that a plan, however practicable and ingenious under the then existing circumstances, became, *ipso facto*, impossible of application under these altered circumstances.

The mountains remained the same—even the roads; but the conditions of supply had been entirely altered: and this strikes fundamentally at every plan of campaign. The essence of the plan had already been drawn up by Bonaparte himself, when attached to the Topographical Bureau in Paris two years previously, and had been sent for execution to Kellerman, commanding-in-chief on the spot, in 1795. But the Austrians that year gave no opening; and it required a different type of warlike genius to create one in the existing situation.

As it happened, it was the Austrians themselves who, by a local and partial offensive, gave Bonaparte his chance. How he would have obtained it without their assistance it is not easy to conjecture; though the presumption is that his entirely novel conception of the method of handling masses, combined with the extraordinary gift he possessed of inspiring confidence in his subordinates—the spell of which had already been felt by all who had come in contact with him, would soon have found a way to accomplish his object.

Actually Major Kuhl shows very conclusively that until the defeat of the Austrians at Dego, it was the British fleet which really held the key of the whole position; and we submit that it was only the innate consciousness of the power it might at any moment exert, which justified Bonaparte in departing from the instructions he had received from the Directory, and turning upon the Sardinians instead of following up his victories over the Austrians. Clausewitz always adhered to the views of the Directory, and in after years instanced the Waterloo campaign as a proof of the necessity of sticking to a beaten enemy to the last breath of man and horse, particularly when allies have widely divergent political aims and bases, and the beaten army is the more powerful of the two—as in 1796. In 1815 this would certainly seem to have been the better plan to pursue: the further the Prussians were driven eastward the better and more numerous the communications with France which would have been opened up. In 1796, however, the conditions were materially different: the defeat of the Sardinians opened up fresh lines of supply, and rendered fresh bodies of troops available, whereas pursuit of the Austrians might have forced the hand of the British admiral and brought about combined action at any point along the Corniche road, which Nelson had already done his best to initiate.

The chief interest of the book for us at the present moment lies in the masterly way in which the evils of over-centralisation of command and the inherent weakness of the "cordon" system are exposed. Both had sprung into existence as a natural consequence of prevailing conditions, precisely as our South African methods of brigade commands and blockhouses originated out there. The danger lies in the tendency of any system to become stereotyped in the Staff of an army; and to avert that tendency we would strongly recommend an exhaustive study of this campaign, which, as Major Kuhl's sub-title very appropriately reminds us, is "the starting-point of modern strategy."

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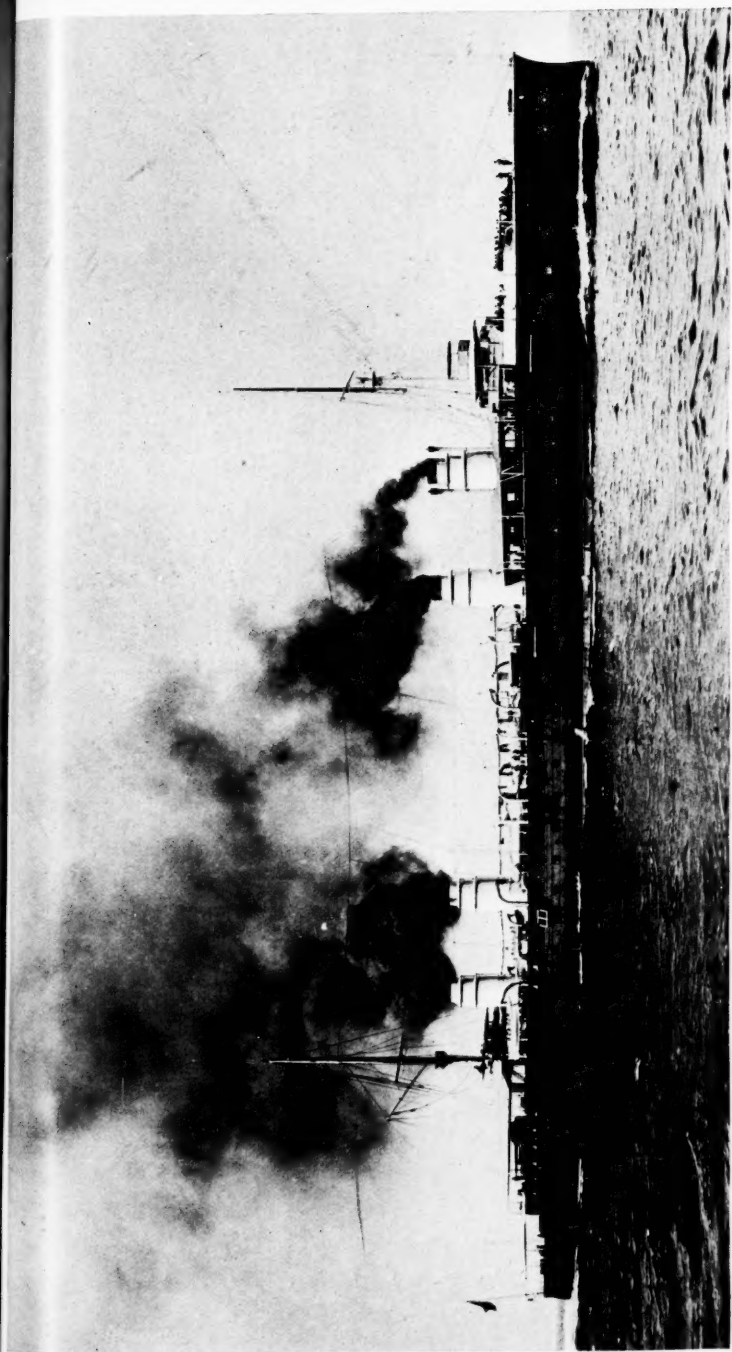
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